

Industrial Calibration Co., Ltd.

3841 Moo. 3, Lum Luk Ka Road., Khu Khot Subdistrict,
Lam Luk Ka District, Phatum Thani 12130 Thailand.

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Email : info@industrial.co.th



CERTIFICATE No. CAL02055-22 PAGE 1 OF 2

Certificate of Calibration

Equipment : EC/ TDS/ TEMPERATURE METER
Manufacture : HM DIGITAL
Model / Type : COM-100
Serial No. : PONPE5851384
ID No. : N/A

Customer : Environment Research & Technology Co., Ltd.
25/114 Moo 6, Soi Chinnaket 1, Ngamwongwan Road., Tungsohong, Laksi, Bangkok 10210
Environment: 25 +/- 3°C (IN-HOUSE); 50 +/- 20%RH

Date Of Receipt : FEB 23, 2022

Date Of Calibration : FEB 23, 2022

Calibration By : [REDACTED]

Approved By : [REDACTED]

Date of issue : FEB 23, 2022

MEASUREMENT UNCERTAINTY :

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR $k = 2$, WHICH EFFECTIVE DEGREE OF FREEDOM $Verf > 100$ CORRESPONDS A LEVEL OF CONFIDENCE OF APPROXIMATELY 95 %

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CERTIFICATE No. CAL02055-22 PAGE 2 OF 2

Calibration Report

ORDER No. 2009-054 RECEIVED DATE : FEB 23, 2022

CALIBRATION DATE : FEB 23, 2022

DESCRIPTION:		MANUFACTURER:	
EC/ TDS/ TEMPERATURE METER			HM DIGITAL
MODEL:	SERIAL No.	IDENTIFICATION No:	MADE IN :
COM-100	PONPE5851384	N/A	N/A
CALIBRATION METHOD : THIS INSTRUMENT WAS CALIBRATED BY COMPARISON WITH STANDARD BUFFER SOLUTION IN-HOUSE METHOD			
REFERENCE STANDARD :			
DESCRIPTION :		MODEL	SIN No.
STANDARD BUFFER SOLUTION		ECCON1413BT	01X211207
			CERTIFICATE No.
			06001

TRACEABILITY:

THE CERTIFICATE IS TRACEABLE TO THE INTERNATIONAL SYSTEM OF UNIT MAINTAINED AT: NIST
-NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

RANGE : 1413 μ S RESOLUTION : 1 μ S

FUNTION : CONDUCTIVITY MEASUREMENT

CALIBRATION	POINT	SETTING CONDUCTIVITY	UUC*	READING	UUC*	CORRECTION	UNCERTAINTY
	(μ S)	(μ S)		(μ S)		(μ S)	MASEMENT
	1413	1413		1420	-7	(μ S)	12

REMARK : UUC* UNIT UNDER CALIBRATION

- END OF CERTIFICATE -



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
53/61 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250
TEL. 0-2717 3800 27 FAX. 0-2719-9486



Cert.No.: 22CHO7
Page.: 1 of 2

Certificate of Calibration

Equipment : pH Meter
Manufacturer : WTW
Model : inoLab pH 730
Serial No. : 10510388
ID No. : ERTC-L-In-049
Condition As-Received:
Received Date : 05 January 2022
Calibration Date : 06 January 2022
Reference : 2201-0006ON-16

Submitted by : Environment Research & Technology Company Limited.
25/114 Moo 6, Soi Chinakel 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210

Calibration Place : ห้องปฏิบัติการ BOD (501)
Ambient Temperature : (22.7 - 24.1) °C
Relative Humidity : (56 - 60) %
Calibration Procedure : In - house method :

- CP-OCH2 by direct measurement with standard voltage calibrator and direct measurement with certified reference material (CRM)

Calibrated by : Uthen Kankawi

Approved by :

(✓) Malee Butkruea
() Sathip Meangmai
() Warakorn Lemgagrakul

Issue Date :

19 January 2022

The uncertainties are for a confidence probability of approximately 95 %

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Condition of this calibration result

1. Reference Standard Instrument : -
Instrument Serial No. ID No. Cert. No. Due Date
1) Document Process Calibrator 46530031 130RC098 21E3245 07 Oct 2022
2) Digital Thermometer 130RC017 21T686 08 Apr 2022
This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution Manufacturer Lot No. Exp. date
pH 4.008 CPA chem 766820 23 Sep 2023
pH 6.982 CPA chem 761017 02 Aug 2022
pH 10.015 CPA chem 761018 02 Aug 2022

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Fluke at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (\pm mV)	Coverage factor k
			mV	pH		
pH Meter	4.000	177.48	177.5	4.009	0.058	2.00
S/N.: 10510388	7.000	0.00	0.0	7.000	0.058	2.00
	10.000	-177.48	-177.5	10.011	0.058	2.00

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH measurement (\pm)	Coverage factor k
pH Electrode	4.008	4.007	172.2	0.0047	2.00
S/N.: C211621046	6.982	6.981	-1.9	0.0092	2.00
	10.015	10.010	-179.2	0.011	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

-o0o-

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Cert.No.: 22TW15
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115V
Serial No. : 03C1280 AC
ID No. : ERTC-L-in-021
Received Date : 19 January 2022
Test Date : 21 January 2022
Reference : 2201-0594WN-1
Submitted by : Environment Research & Technology Company Limited,
25/114 Moo 6, Soi Chinaket 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210

Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean
Approved by : 
(/) Malee Butkruea
() Sathip Meangmai
() Warakorn Lernagatrakul

Issue Date : 1 February 2022

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 07H100306

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.16	8.15	0.0071

This report was certified only for the instrument we tested.It is allowable to use for study the system efficiency.The environmental impact control and present to organization it may concerned Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced other in full,without written approval of the laboratory

-o0o-

Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Laksale Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+66 2723 0382
MT-TH.ServiceSupport@mtl.com



Accuracy Calibration Certificate

Customer

Company: ENVIRONMENT RESEARCH&TECHNOLOGY CO., LTD.
Address: 25/114 Moo 6, Soi Chinakret 1, Ngamwongwan Rd., Toongsuengho
City: Luksei
Zip / Postal: 10210
State / Province: Bangkok
Order Number:  0332332857

Ramita Taengthai

Weighing Device

Manufacturer: Mettler Toledo
Model: NS20MTS/00
Serial No.: B547728937
Building: N/A
Floor: 5
Room: 504
Weighing Instrument: ERTCL-IN-114
Asset Number: N/A
Terminal Model: N/A
Terminal Serial No.: N/A
Terminal Asset No.: N/A

Range	Max. Capacity	Readability (d)
1	220 g	0.0001 g

Procedure

Calibration Guideline:
METTLER TOLEDO Work Instruction: EURAMET cg-18 v. 4.0 (11/2015)
CPW002/20

This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.

The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Temperature		Humidity	
	Start: 23.8 °C	End: 24.5 °C	Start: 49.7 %	End: 55.1 %

As Found Calibration Date: 19-Jan-2022
As Left Calibration Date: N/A
Issue Date: 20 Jan 2022

Approved Signatory:

- ☒ Kassakorn Jassananachaiskul
☐ Santi Jitinyom
☐ Surachet Sukkate

Measurement Results

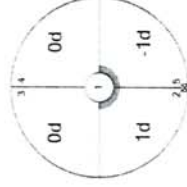
Repeatability

Test Load: 100 g		As Found	As Left
1	As Found	99.9999 g	N/A
2	As Left	99.9998 g	N/A
3		99.9998 g	N/A
4		99.9999 g	N/A
5		99.9999 g	N/A
6		99.9999 g	N/A
7		99.9998 g	N/A
8		99.9999 g	N/A
9		99.9998 g	N/A
10		99.9999 g	N/A
Standard Deviation		0.00005 g	N/A

The "g" in the graph represents the readability of the range/interval in which the test was performed.
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g		As Found	As Left
Position		As Found	As Left
1	Od	99.9998 g	N/A
2	Od	99.9999 g	N/A
3	Od	99.9998 g	N/A
4	Od	99.9998 g	N/A
5	Od	99.9997 g	N/A
Maximum Deviation		0.0001 g	N/A



The "g" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

As Found	Referencio Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.12 mg	2
2	0.0500 g	0.0500 g	0.0000 g	0.13 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.13 mg	2
4	0.5000 g	0.5000 g	0.0000 g	0.13 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.13 mg	2
6	5.0000 g	5.0000 g	0.0000 g	0.14 mg	2
7	10.0000 g	10.0000 g	0.0000 g	0.14 mg	2
8	50.0000 g	50.0000 g	0.0000 g	0.18 mg	2
9	99.9999 g	99.9998 g	-0.0001 g	0.24 mg	2
10	149.9999 g	149.9998 g	-0.0001 g	0.34 mg	2
11	199.9999 g	200.0000 g	0.0001 g	0.39 mg	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.:	WS03	Date of Issue:	21-Sep-2021
Certificate Number:	175498	Calibration Due Date:	14-Mar-2023

Thermo Hygrometer

Equipment No.:	IN281	Date of Issue:	25-May-2021
Certificate Number:	21H1100	Calibration Due Date:	10-May-2022

Remarks

FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-4} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: 4 K

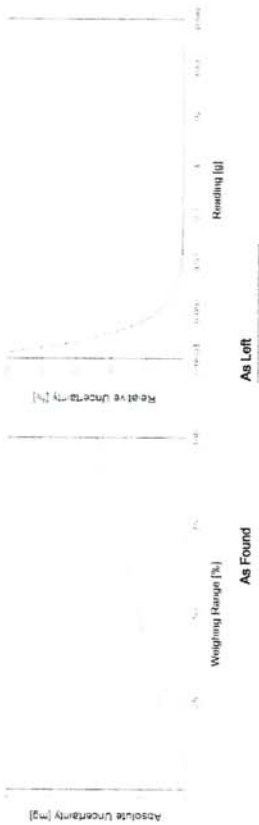
Linearization of Uncertainty Equation

Range		As Found	As Left
d	Max		
1	0.0001 g	220 g	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.0220 g	0.13 mg	N/A
0.2200 g	0.13 mg	N/A
2.2000 g	0.15 mg	N/A
22.0000 g	0.31 mg	N/A
220.0000 g	2.0 mg	N/A



GWP®
Certificate



As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed:



As Found



As Left

No adjustments/modifications made. As Left results correspond to As Found.

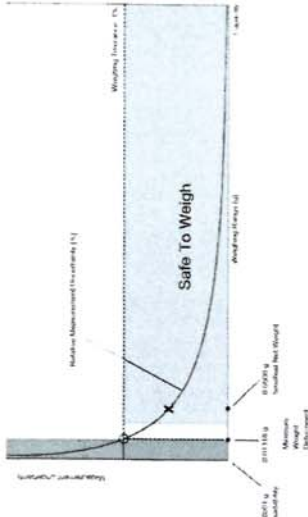
Process Requirements

Weighing Tolerance: 1%

Smallest Net Weight: 0.0500 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. The graph reflects As Left testing, unless only As Found was performed.

Minimum Weight

As Found Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.13276 g	0.26775 g	0.40503 g	0.68670 g	1.43539 g
0.2%	0.06610 g	0.13276 g	0.19997 g	0.33610 g	0.68670 g
0.5%	0.02637 g	0.05284 g	0.07939 g	0.13276 g	0.26775 g
1%	0.01318 g	0.02637 g	0.03960 g	0.06610 g	0.13276 g
2%	0.00659 g	0.01318 g	0.01977 g	0.03298 g	0.06610 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01318 g	0.02637 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.13276 g	0.26775 g	0.40503 g	0.68670 g	1.43539 g
0.2%	0.06610 g	0.13276 g	0.19997 g	0.33610 g	0.68670 g
0.5%	0.02637 g	0.05284 g	0.07939 g	0.13276 g	0.26775 g
1%	0.01318 g	0.02637 g	0.03960 g	0.06610 g	0.13276 g
2%	0.00659 g	0.01318 g	0.01977 g	0.03298 g	0.06610 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01318 g	0.02637 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k = 2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

1. If "N/A" is shown above, no appropriate value could be calculated.
2. METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results

Results Summary

		Repeatability	Eccentricity	Error of Indication
As Found	As Found	✓	✓	✓
	As Left	✓	✓	✓

✓ = Passed

✗ = Failed

N/A = Safety Factor not met

Repeatability

Test Load: 100 g

Tolerance	Control Limit		As Found		As Left	
			Std. Deviation	Result	Std. Deviation	Result
0.1%		N/A		N/A		N/A
0.2%		0.00005 g		✓		✓
0.5%		0.00013 g		✓		✓
1%		0.00025 g		✓	0.00005 g*	✓
2%		0.00050 g		✓		✓
5%		0.00125 g		✓		✓

*The calculated standard deviation value is below the rounding error of the balance. The 0.411'd rule is used for the assessment of this repeatability test and the calculation of the minimum weight.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit		As Found		As Left	
			Deviation	Result	Deviation	Result
0.1%		0.0500 g		✓		✓
0.2%		0.1000 g		✓		✓
0.5%		0.2500 g		✓		✓
1%		0.5000 g	0.0001 g	✓	0.0001 g	✓
2%		1.0000 g		✓		✓
5%		2.5000 g		✓		✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Error of Indication

As Found

Reference Value	Error	Control limits for various weighing tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
149.9999 g	-0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
199.9999 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

As Left

Reference Value	Error	Control limits for various weighting tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/A	N/A	0.1250 g	0.2500 g	0.5000 g	N/A
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
149.9999 g	-0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
199.9999 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result			✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

Service Date: 2022-01-19

Document Number: TH2065-164-011922-LABBalanceHR

ENVIRONMENT RESEARCH & TECHNOLOGY CO., LTD.

25/114 Moo 6, Soi Chinaket 1, Noamwongwan Rd., Toongsongho n. samutprakan, Lakei, Bangkok 10210

Ramita Taonathai

METTLER TOLEDO

Balance Health Report

Device Details		System Details	
Manufacturer:	Mettler Toledo	Accessory 1:	
Model:	MS204TS	Accessory 2:	
Serial number:	BS47728937	Weight set for routine testing:	Yes /
Firmware:	3.50		

History

Device History		Service History	
Instrument in use:	Yes	Last preventive maintenance	< 1 year
Instrument age:	3-10 years	Last instrument calibration:	< 1 year
Spare parts available:	Yes	Last minimum weight determination:	< 1 year
Regulations:	ISO		
Process tolerance in %:	1%		
Smallest sample not weight:	0.0500 g	Routine testing performed:	Yes

Check List

Environmental Conditions		General & Functional Checks	
Room temperature fluctuation	✓	Leveling	✓
Exposure to direct sun	✓	Clearliness	✓
Vibrations	✓	Completeness - missing parts see additional remarks	✓
Draft	✓	Settings optimized for operating environment	✓
Dirt or dust	✓	Other - objections noted as additional remarks	—
Static	✓		
Mechanical Component Checks		Electrical Component Checks	
Draft shield	✓	Power supply	✓
Weighting pan position	✓	Sliding door drive	✓
Housing	✓	Internal weight drive	✓
Other - objections noted as additional remarks	—	Display	✓
		Other - objections noted as additional remarks	—

Recommendations

Measurement Result Quality		Process Efficiency	
Instrument calibration		Universal instrument	
Identify safe weighing range		Replace instrument	
GWP verification / risk assessment		Replace / add parts (see additional remarks)	
Preventive maintenance		Onsite repair	
Perform routine testing with test weights		Depot repair	
User training		Use of accessories (see additional remarks)	
Contact: Rama Teangthai	Position: N/A	Phone: 0965334480	Email: ramteang@research.co.th

Additional Remarks & Recommendations

Engineer Details

Date: 19 Jan 2022

Name: Suwicha Choykarnchua

Signature: _____

This is not a certificate.

It should not be used to interpret final results for the testing of these devices.

Legend:

✓ Good/Pass

! Needs Attention

X Bad/Fail

— Not Applicable

8404 - 846/5 Lonsdale Rd. Hangera Tai Sub District, Hangera District, Banckok 10220. *06 2723 0382

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Recent Version: 1.13 Software Version: 4.26.2.19 Page: 1/10 METTER THERMO



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANILUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3800-27 FAX. 0-2719-9184



MSC-TSI-TS17035
CALIBRATION 8088

Cert. No.: 22TM4
Page.: 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : Binder
Model : ED 115
Serial No. : 950433
ID No. : ERTC-L-In.-009
Submitted by : Environment Research & Technology Company Limited
25/114 Moo 6 Soi Chinaket 1,
Ngamwongwan Road, Toongsonghong, Lakso,
Bangkok 10210
Location : 408/2 ห้องปฏิบัติการเภสัชภัณฑ์
Received Order : 5 January 2022
Calibration Date : 6 January 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
Calibrated by : Khit Ruttanaprapachai

Approved by :
Approved Signatory

(/) Ponthippa Taneyakul
(✓) Malee Buikrua
() Suwit Injai

Issue Date : 19 January 2022

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2201-0006ON-5

Cert. No.: 22TM4
Page.: 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument **Model** **Serial No.** **Cert. No.** **Due Date**
1) Data Acquisition 34970A MY44060450 21LM4/1 06 Mar 2022

2. This certificate is valid only to the item calibrated on date and place of calibration.

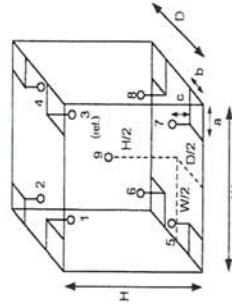
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration	
Beginning	Finished
Temp. (°C)	26
REL Humid. (%)	59
AC Supply (Volt)	221
	222



Probe Installation Details : **Dimension of Chamber :**
a = 5.0 cm D = 0.50 m
b = 5.0 cm W = 0.60 m
c = 5.0 cm H = 0.50 m
Capacity = 0.15 m³

Position :	Ref. Std. ID No.:
1	19-14RTD-01
2	19-14RTD-02
3	19-14RTD-03
4	19-14RTD-04
5	19-14RTD-05
6	19-14RTD-06
7	21-14RTD-07
8	19-14RTD-08
9 (ref.)	19-14RTD-09

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a 1089977



Equipment: Incubator
Condition As-Received: Used Item
Reference: 2201-0006ON-5
Result of Calibration :- (*) Without Adjustment
Function of UUC*: Temperature Source
Fresh air setting: Close

Cert. No.: 22TM4
Page.: 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor <i>k</i>		
35	35	35	0.17	0.22	0.48	0.66	2		
Measured Temperature (°C)									
Calibration Point (°C)	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
35	35.011	35.019	34.925	34.979	34.842	34.791	34.848	34.825	34.886

Average*: The average of 30 values in each position.

Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity: The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation: The Difference of the maximum and minimum measured temperatures throughout observation.

UUC*: Unit Under Calibration

Note: The reported uncertainty of measurement was included stability and excluded uniformity.

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

-oOo-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717 8000-37 FAX. 0-2719-0484



NEC-TS-1517925
CALIBRATION 0506

Cert. No.: 22TM154
Page.: 1 of 3

Certificate of Calibration

Equipment: Incubator

Manufacturer: Ehret

Model: BK 4106

Serial No.: 22162

ID No.: ERTC-L-In-022

Submitted by: Environment Research & Technology Company Limited
25/114 Moo 6 Sol Chinakhet 1,
Ngamwongwan Road, Toongsonghong, Laksi,
Bangkok 10210

Location: 408/2 ห้องปฏิบัติการมาตรฐานสิ่งแวดล้อม

Received Order: 5 January 2022

Calibration Date: 6 January 2022

Ambient Temperature: (26 ± 10) °C

Relative Humidity: (50 ± 30) %

Calibrated by: Man Pattanapongpaiboon

Approved by: 
Approved Signatory

() Ponthippa Tameyakul
() Malee Butkruea
() Suwit Imjai

Issue Date: 19 January 2022

The Uncertainties are for a confidence probability of approximately 95 %

This certificate may not be reproduced other than in full, except with the prior written

Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services

a 1089976

A 0036712



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)

CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES

534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250

TEL. 0-2717-3000 FAX. 0-2719-9484



Cert.No.: 22TW242
Page.: 2 of 2

Cert.No.: 22TW242
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115
Serial No. : 17H104220
ID No. : ERTC-L-In.137
Received Date : 26 October 2022
Test Date : 27 October 2022
Reference : 2210-0840WN-1
Submitted by : Environment Research & Technology Company Limited.
25/114 Moo 6, Soi Chinaket 1, Ngamwongwan Road,
Toongsonghong, Laksi, Bangkok 10210
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walalak Sirithean

Approved by :
(✓) Malee Buikrua
() Sathip Meangmai
() Warakorn Lemgagrakul

Issue Date : 1 November 2022

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	21CG1389	25 Mar 2023
2) Balance	1126143764	140RC004	22MM50	20 Sep 2023

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %

Dissolved Oxygen Probe No.: 15K100353

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.14	8.13	0.0071

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency. The environmental impact control and present to organization it may concerned Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory

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a 1133339

Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Laksale Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+66 2723 0382
MT-TH.ServiceSupport@mt.com



Accuracy Calibration Certificate

Customer

Company: ENVIRONMENT RESEARCH&TECHNOLOGY CO., LTD.
Address: 25/114 Moo 6, Soi Chirakiet 1, Ngamwongwan Rd., Toongsongkhro
City: Lakse
Zip / Postal: 10210
State / Province: Bangkok
Order Number: 00332388777

Contact: Ramla Taengthai

Weighing Device

Manufacturer: Mettler Toledo
Model: MS204TS000
Serial No.: B547728937
Building: N/A
Floor: 5
Room: 504

Weighing Instrument
ERTCL-IN-114
N/A
N/A
N/A

Range	Max. Capacity	Readability (d)
1	220 g	0.0001 g

Procedure

Calibration Guideline: EURAMET cg-18 v. 4.0 (11/2015)
CPIW002/20

METTLER TOLEDO Work Instruction:
This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.

The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.
In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Temperature	Humidity
	Start: 23.8 °C End: 24.5 °C	Start: 49.7 % End: 55.1 %

As Found Calibration Date: 19-Jan-2022
As Left Calibration Date: N/A
Issue Date: 20-Jan-2022

Approved Signatory:

☐ Santti Jilhiyom
☐ Surachet Sukkate

Measurement Results

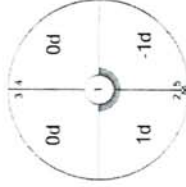
Repeatability

Test Load: 100 g	As Found	As Left
1	99.9999 g	N/A
2	99.9998 g	N/A
3	99.9998 g	N/A
4	99.9999 g	N/A
5	99.9999 g	N/A
6	99.9999 g	N/A
7	99.9998 g	N/A
8	99.9999 g	N/A
9	99.9998 g	N/A
10	99.9999 g	N/A
Standard Deviation	0.00005 g	N/A

The "d" in the graph represents the readability of the range/interval in which the test was performed.
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g	As Found	As Left
Position 1	99.9998 g	N/A
2	99.9999 g	N/A
3	99.9998 g	N/A
4	99.9998 g	N/A
5	99.9997 g	N/A
Maximum Deviation	0.0001 g	N/A



The "d" in the graph represents the readability of the range/interval in which the test was performed.

Error of Indication

As Found				
	Reference Value	Indication	Error of Indication	Expanded Uncertainty
1	0.0000 g	0.0000 g	0.0000 g	0.12 mg
2	0.0500 g	0.0500 g	0.0000 g	0.13 mg
3	0.1000 g	0.1000 g	0.0000 g	0.13 mg
4	0.5000 g	0.5000 g	0.0000 g	0.13 mg
5	1.0000 g	1.0000 g	0.0000 g	0.13 mg
6	5.0000 g	5.0000 g	0.0000 g	0.14 mg
7	10.0000 g	10.0000 g	0.0000 g	0.14 mg
8	50.0000 g	50.0000 g	0.0000 g	0.18 mg
9	99.9999 g	99.9998 g	-0.0001 g	0.24 mg
10	149.9999 g	149.9998 g	-0.0001 g	0.34 mg
11	199.9999 g	200.0000 g	0.0001 g	0.39 mg



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2			
Weight Set No.:	WS03	Date of Issue:	21-Sep-2021
Certificate Number:	175498	Calibration Due Date:	14-Mar-2023
Thermo Hygrometer			
Equipment No.:	IN281	Date of Issue:	25-May-2021
Certificate Number:	21H1100	Calibration Due Date:	10-May-2022

Remarks

FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-6} / K$
Temperature range on site for the evaluation of the measurement uncertainty in use: 4 K

Linearization of Uncertainty Equation

Range		As Found	As Left
d	Max		
1	0.0001 g	220 g	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.0220 g	0.13 mg	N/A
0.2200 g	0.13 mg	N/A
2.2000 g	0.15 mg	N/A
22.0000 g	0.31 mg	N/A
220.0000 g	2.0 mg	N/A



GWP®
Certificate



As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed:



As Found



As Left

No adjustments/modifications made. As Left results correspond to As Found.

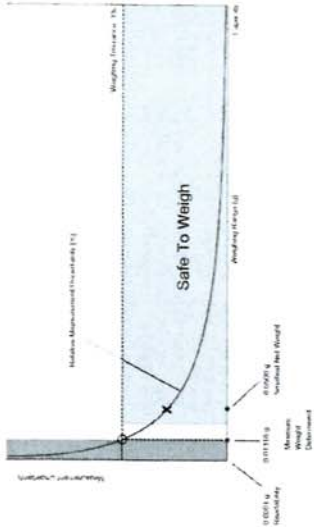
Process Requirements

Weighing Tolerance: 1%

Smallest Net Weight: 0.0500 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.

Minimum Weight

As Found Minimum Weight Table

Tolerance	Minimum weights for different weighing tolerances and safety factors				
	1	2	3	5	10
0.1%	0.13276 g	0.26775 g	0.40503 g	0.68670 g	1.43539 g
0.2%	0.08610 g	0.13276 g	0.19997 g	0.33610 g	0.68670 g
0.5%	0.02637 g	0.05284 g	0.07939 g	0.13276 g	0.26775 g
1%	0.01318 g	0.02637 g	0.03960 g	0.06610 g	0.13276 g
2%	0.00659 g	0.01318 g	0.01977 g	0.03298 g	0.06610 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01318 g	0.02637 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Tolerance	Minimum weights for different weighing tolerances and safety factors				
	1	2	3	5	10
0.1%	0.13276 g	0.26775 g	0.40503 g	0.68670 g	1.43539 g
0.2%	0.08610 g	0.13276 g	0.19997 g	0.33610 g	0.68670 g
0.5%	0.02637 g	0.05284 g	0.07939 g	0.13276 g	0.26775 g
1%	0.01318 g	0.02637 g	0.03960 g	0.06610 g	0.13276 g
2%	0.00659 g	0.01318 g	0.01977 g	0.03298 g	0.06610 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01318 g	0.02637 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k = 2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

- 1. If "N/A" is shown above, no appropriate value could be calculated.
- 2. METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results

Results Summary

	Repeatability		Eccentricity		Error of Indication	
	As Found	As Left				
✓ = Passed	✓	✓	✓	✓	✓	✓
✗ = Failed						
Δ = Safety Factor not met						

Repeatability

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left		Result
		Std. Deviation	Result	Std. Deviation	Result	
0.1%	N/A		N/A			N/A
0.2%	0.00005 g		✓			✓
0.5%	0.00013 g		✓			✓
1%	0.00025 g		✓	0.00005 g*		✓
2%	0.00050 g		✓			✓
5%	0.00125 g		✓			✓

*The calculated standard deviation value is below the rounding error of the balance. The 0.41*d rule is used for the assessment of this repeatability test and the calculation of the minimum weight.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found		As Left		Result
		Deviation	Result	Deviation	Result	
0.1%	0.0500 g		✓			✓
0.2%	0.1000 g		✓			✓
0.5%	0.2500 g	0.0001 g	✓	0.0001 g		✓
1%	0.5000 g		✓			✓
2%	1.0000 g		✓			✓
5%	2.5000 g		✓			✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Error of Indication

As Found

Control limits for various weighing tolerances									
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%		
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A		
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g		
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g		
149.9999 g	-0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g		
199.9999 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g		
Result		✓	✓	✓	✓	✓	✓		✓

As Left

Control limits for various weighing tolerances									
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%		
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A		
50.0000 g	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g		
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g		
149.9999 g	-0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g		
199.9999 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g		
Result		✓	✓	✓	✓	✓	✓		✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

Service Date: 2022-01-19
Document Number: TH2065-164-011922-LABSLINCOTHR
ENVIRONMENT RESEARCH&TECHNOLOGY CO.,LTD
25/114 Moo 6, Soi ChanaKet 1, Ngamwongwan Rd., Toongsonghro n. ๓, Bangkok 10210
Ramita Taengthai

Balance Health Report

Device Details

System Details	
Manufacturer:	Mettler Toledo
Model:	MS204TS
Serial number:	B54778937
Firmware:	3.50
Accessory 1:	
Accessory 2:	
Weight set for routine testing:	Yes /

History

Device History		Service History	
Instrument in use:	Yes	Last preventive maintenance:	< 1 year
Instrument age:	3-10 years	Last instrument calibration:	< 1 year
Spare parts available:	Yes	Last minimum weight determination:	< 1 year
Regulations:	ISO	Routine testing performed:	Yes
Process tolerance in %:	1%		
Smallest sample net weight:	0.0500 g		

Check List

Environmental Conditions		General & Functional Checks	
Room temperature fluctuation	✓	Leveling	✓
Exposure to direct sun	✓	Cherliness	✓
Vibrations	✓	Completeness - missing parts see additional remarks	✓
Draft	✓	Settings optimized for operating environment	✓
Dirt or dust	✓	Other - objections noted as additional remarks	—
Static	✓		
Mechanical Component Checks		Electrical Component Checks	
Draft shield	✓	Power supply	✓
Weighing pan position	✓	Sliding door drive	✓
Housing	✓	Internal weight drive	✓
Other - objections noted as additional remarks	—	Display	✓
		Other - objections noted as additional remarks	—

Recommendations

Measurement Result Quality		Process Efficiency	
Instrument calibration		Uninstall instrument	
Identify safe weighing range		Replace instrument	
GMP verification / risk assessment		Replace / add parts (see additional remarks)	
Preventive maintenance		Onsite repair	
Perform routine testing with test weights		Depot repair	
User training		Use of accessories (see additional remarks)	
Contact	Name: Ramita Taengthai Position: N/A Phone: 086534490 Email: ramita@mettlerresearch.co.th	Engineer Details Date: 19 Jan 2022 Name: Suwicha Choykanchu Signature:	

Mettler-Toledo (Thailand) Ltd.
846/4 - 846/5 Lamsale Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10760
+66 2723 0382
MT-TH.ServiceSupport@mtl.com



NSC 151-ITS 17025
CALIBRATION 0082

Accuracy Calibration Certificate

Customer

Company: ENVIRONMENT RESEARCH&TECHNOLOGY CO., LTD.
Address: 25/114 Moo 6, Soi Chinakot 1, Ngamwongwan Rd., Thungsongpho
City: Lakki
Contact: Ramita Taengthai
Zip / Postal: 10210
State / Province: Bangkok
Order Number:  833318232

Weighing Device

Manufacturer:	Mettler Toledo	Instrument Type:	Weighing Instrument
Model:	MS204S01	Asset Number:	ERTCL-IN-088
Serial No.:	B334691537	Terminal Model:	N/A
Building:	N/A	Terminal Serial No.:	N/A
Floor:	5	Terminal Asset No.:	N/A
Room:	504		

Range	Max. Capacity	Readability (g)
1	220 g	0.0001 g

Procedure

Calibration Guideline:

METTLER TOLEDO Work Instruction:

EURAMET cp-18 v. 4.0 (11/2015)
CPW002/20

This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.

The sensitivity/span of the weighing instrument was adjusted before calibration with a built-in weight.

In accordance with EURAMET cp-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Temperature		Humidity	
	Start: 23.9 °C	End: 24.2 °C	Start: 45.8 %	End: 54.8 %

As Found Calibration Date:

19-Jan-2022

Calibrator:

N/A

As Left Calibration Date:

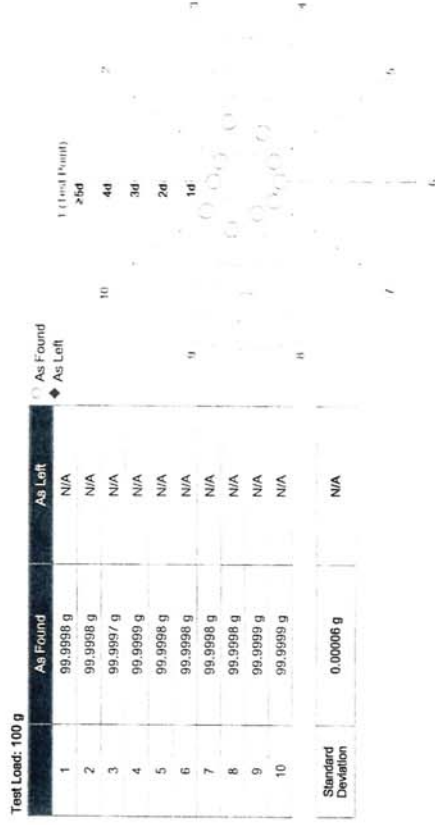
20 Jan 2022

Approved Signatory:

☐ Santi Jitniyom
☐ Surachet Sukkato

Measurement Results

Repeatability



Eccentricity



Error of Indication

As Found	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.14 mg	2
2	0.0500 g	0.0500 g	0.0000 g	0.15 mg	2
3	0.1000 g	0.1000 g	0.0000 g	0.15 mg	2
4	0.5000 g	0.5000 g	0.0000 g	0.15 mg	2
5	1.0000 g	1.0000 g	0.0000 g	0.15 mg	2
6	5.0000 g	5.0000 g	0.0000 g	0.16 mg	2
7	10.0000 g	10.0000 g	0.0000 g	0.16 mg	2
8	50.0000 g	49.9999 g	-0.0001 g	0.19 mg	2
9	99.9999 g	99.9998 g	-0.0001 g	0.25 mg	2
10	149.9999 g	149.9997 g	-0.0002 g	0.35 mg	2
11	199.9999 g	199.9998 g	-0.0001 g	0.39 mg	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.:	WS03	Date of Issue:	21-Sep-2021
Certificate Number:	175498	Calibration Due Date:	14-Mar-2023

Thermo Hygrometer

Equipment No.:	IN281	Date of Issue:	25-May-2021
Certificate Number:	21H1100	Calibration Due Date:	10-May-2022

Remarks

FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $1.5 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: 4 K

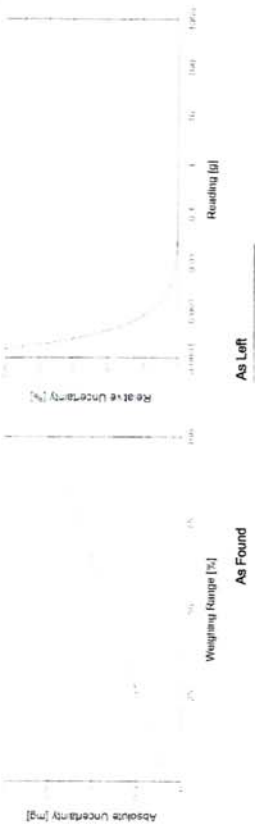
Linearization of Uncertainty Equation

Range		As Found	As Left
d	Max		
1	0.0001 g	220 g	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication		As Found	As Left
0.0220 g	0.15 mg	0.68%	N/A
0.2200 g	0.15 mg	0.069%	N/A
2.2000 g	0.16 mg	0.00/4%	N/A
22.0000 g	0.28 mg	0.0013%	N/A
220.0000 g	1.5 mg	0.00067%	N/A



GWP®
Certificate



As Found



As Left



The weighing device meets the given process requirements.

The weighing device meets the given process requirements.

Tests Performed:



As Found



As Left

No adjustments/modifications made. As Left results correspond to As Found.

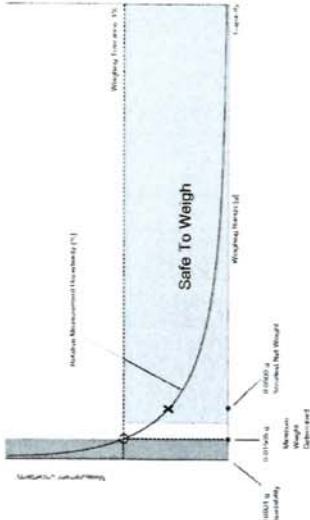
Process Requirements

Weighing Tolerance: 1 %

Smallest Net Weight: 0.0500 g

Safety Factor: 2

Safe Weighing Range



While the values in this graph reflect the actual calibration results, the measurement uncertainty curves are simply a visual representation. This graph reflects As Left testing, unless only As Found was performed.

Minimum Weight As Found Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.15146 g	0.30476 g	0.45993 g	0.77601 g	1.60147 g
0.2%	0.07550 g	0.15146 g	0.22788 g	0.38211 g	0.77601 g
0.5%	0.03015 g	0.06037 g	0.09066 g	0.15146 g	0.30476 g
1%	0.01506 g	0.03015 g	0.04525 g	0.07550 g	0.15146 g
2%	0.00753 g	0.01506 g	0.02260 g	0.03770 g	0.07550 g
5%	0.00301 g	0.00602 g	0.00904 g	0.01506 g	0.03015 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Minimum weights for different weighing tolerances and safety factors					
Tolerance	Safety Factor				
	1	2	3	5	10
0.1%	0.15146 g	0.30476 g	0.45993 g	0.77601 g	1.60147 g
0.2%	0.07550 g	0.15146 g	0.22788 g	0.38211 g	0.77601 g
0.5%	0.03015 g	0.06037 g	0.09066 g	0.15146 g	0.30476 g
1%	0.01506 g	0.03015 g	0.04525 g	0.07550 g	0.15146 g
2%	0.00753 g	0.01506 g	0.02260 g	0.03770 g	0.07550 g
5%	0.00301 g	0.00602 g	0.00904 g	0.01506 g	0.03015 g

Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k = 2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

1. If "N/A" is shown above, no appropriate value could be calculated.
2. METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results Results Summary

		Repeatability	Eccentricity	Error of Indication
	As Found	✓	✓	✓
	As Left	✓	✓	✓
✓ = Passed				
✗ = Failed				
⚠ = Safety Factor not met				

Repeatability

Test Load: 100 g

		As Found		As Left	
Tolerance	Control Limit	Std. Deviation	Result	Std. Deviation	Result
0.1%	N/A		N/A		N/A
0.2%	0.00005 g		✗		✗
0.5%	0.00013 g		✓		✓
1%	0.00025 g	0.00006 g*	✓	0.00006 g*	✓
2%	0.00050 g		✓		✓
5%	0.00125 g		✓		✓

*The calculated standard deviation value is below the rounding error of the balance. The 0.41*g rule is used for the assessment of this repeatability test and the calculation of the minimum weight.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

		As Found		As Left	
Tolerance	Control Limit	Deviation	Result	Deviation	Result
0.1%	0.0500 g		✓		✓
0.2%	0.1000 g		✓		✓
0.5%	0.2500 g	0.0001 g	✓	0.0001 g	✓
1%	0.5000 g		✓		✓
2%	1.0000 g		✓		✓
5%	2.5000 g		✓		✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

As Found

Control limits for various weighing tolerances									
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%		
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A		
50.0000 g	-0.0001 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g		
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g		
149.9999 g	-0.0002 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g		
199.9999 g	-0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g		
Result		✓	✓	✓	✓	✓	✓		✓

As Left

Control limits for various weighing tolerances									
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%		
0.0000 g	0.0000 g	N/A	N/A	N/A	N/A	N/A	N/A		
50.0000 g	-0.0001 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g		
99.9999 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g		
149.9999 g	-0.0002 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g		
199.9999 g	-0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g		
Result		✓	✓	✓	✓	✓	✓		✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

Service Date: 2022-01-19
Document Number: TH2065-105-011922-LABBalanceHR
ENVIRONMENT RESEARCH & TECHNOLOGY CO., LTD
25/114 Moo 6, Soi Chinakiet 1, Ngamwongwan Rd., Toongsonghong 6, บางนา, Bangkok 10210
Ramita Taengthai

METTLER TOLEDO

Balance Health Report

Device Details			
System Details			
Manufacturer:	Mettler Toledo	Accessory 1:	
Model:	MS204S	Accessory 2:	
Serial number:	B334691537	Weight set for routine testing:	Yes /
Firmware:	1.74		

History

Device History		Service History	
Instrument in use:	Yes	Last preventive maintenance:	< 1 year
Instrument age:	> 10 years	Last instrument calibration:	< 1 year
Spare parts available:	Yes		
Regulations:	ISO	Last minimum weight determination:	
Process tolerance in %:	1%	Routine testing performed:	Yes
Smallest sample not weight:	0.05g		

Check List

Environmental Conditions		General & Functional Checks	
Room temperature fluctuation	✓	Leveling	✓
Exposure to direct sun	✓	Cleanliness	✓
Vibrations	✓	Completeness - missing parts see additional remarks	✓
Draft	✓	Settings optimized for operating environment	✓
Dirt or dust	✓	Other - objections noted as additional remarks	—
Static	✓	Electrical Component Checks	
Mechanical Component Checks		Power supply	✓
Draft shield	✓	Sliding door drive	—
Weighing pan position	✓	Internal weight drive	✓
Housing	✓	Display	✓
Other - objections noted as additional remarks	—	Other - objections noted as additional remarks	—

Recommendations

Measurement Result Quality			Process Efficacy		
Instrument calibration			Uninstall instrument		
Identify safe weighing range			Replace instrument		
GWP verification / risk assessment			Replace / add parts (see additional remarks)		
Preventive maintenance			Onsite repair		
Perform routine testing with test weights			Dopet repair		
User training			Use of accessories (see additional remarks)		
Contact	Name: Ramita Taengthai	Position: N/A	Phone: 086334490	Email: ramita@environmentech.co.th	
Additional Remarks & Recommendations					
			Engineer Details		
			Date:	19-Jan-2022	
			Name:	Suwicha Choykanchu	
			Signature:		

This is not a certificate.

It should not be used to interpret final results for the testing of these devices.

Legend: ✓ Good/Pass ↓ Needs Attention ✗ Bad/Fail — Not Applicable

84504 - 84951 Lualaba Rd., Bangna Tai Sub District, Bangna District, Bangkok 10260, +66 2723 0302
MT-TH-Service@supportmet.com
www.mt.com

METTLER TOLEDO Service

Report Version: 1.13, Software Version: 4.26.2.10, Page: 1/1, © METTLER TOLEDO

Software Version: 1.23.0.229

Report Version: 2.16.8

Form Number: F103C

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
5/444 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10750
TEL. 0-2717-3000-27 FAX. 0-2719-0384



ITAC-MRA
MSC-TSI-1331726
CALIBRATION 9998

Cert. No.: 22TM152
Page.: 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven
Manufacturer : Memmert
Model : UF 110
Serial No. : B414.0652
ID No. : ERTC-L-In.-098

Submitted by : Environment Research & Technology Company Limited
25/114 Moo 6 Soi Chinaket 1,
Ngamwongwan Road, Toongsonghong, Lakso,
Bangkok 10210
Location : Laboratory (ERTC)

Received Order : 5 January 2022
Calibration Date : 5 January 2022
Ambient Temperature : $(26 \pm 10) ^\circ\text{C}$
Relative Humidity : $(50 \pm 30) \%$
Calibrated by : Man Pattanapongpaiboon
Approved by : [Redacted]

() Pornthippa Tameyakul
() Malee Bulkruea
() Suwit Imjai

Issue Date : 21 January 2022

The Uncertainties are for a confidence probability of approximately 95 %

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services & Equipment Calibration and Testing Services



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2201-0006ON-3
Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

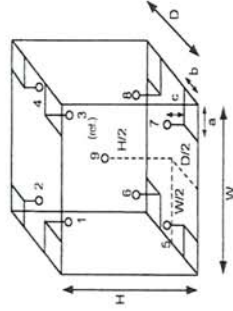
1. Reference standard instrument:-
Instrument **Model** **Serial No.** **Cert. No.** **Due Date**
1) Data Acquisition 34970A MY44031769 21LM12 02 Sep 2022
2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. ($^\circ\text{C}$)	27	27
REL.Humid. (%)	54	58
AC Supply (Volt)	219	222



Ref. Std. ID No.: @		
Position :	(180) $^\circ\text{C}$	(104) $^\circ\text{C}$
1	20-09TC-01	9RTD-2/1
2	20-09TC-02	9RTD-2/2
3	20-09TC-03	9RTD-2/3
4	20-09TC-04	9RTD-2/4
5	20-09TC-05	9RTD-2/5
6	20-09TC-06	9RTD-2/6
7	20-09TC-07	9RTD-2/7
8	20-09TC-08	9RTD-2/8
9 (ref.)	20-09TC-09	9RTD-2/9

Probe Installation Details :
 $a = 5.0 \text{ cm}$
 $b = 5.0 \text{ cm}$
 $c = 5.0 \text{ cm}$
Dimension of Chamber :
 $D = 0.40 \text{ m}$
 $W = 0.56 \text{ m}$
 $H = 0.48 \text{ m}$
 $\text{Capacity} = 0.11 \text{ m}^3$



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2201-00060N-3
Result of Calibration : (*) Without Adjustment
Function of UUC* : Temperature Source
Fresh air setting : Close

Cert. No.: 22TM152
Page.: 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
104.0	104.0	104.0	0.11	1.0	1.9	0.42	2
180.0	180.0	180.0	0.51	2.3	4.2	1.2	2

Calibration Point (°C)	Measured Temperature (°C)								
104.0	Position								
	1	2	3	4	5	6	7	8	9 (ref.)
104.0	105.219	103.394	103.908	104.133	104.348	104.096	103.878	104.103	104.360
180.0	182.291	178.691	178.879	180.031	180.761	180.026	180.572	180.044	180.253

Average* : The average of 30 values in each position.
Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.
Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.
UUC* : Unit Under Calibration
Note : The reported uncertainty of measurement was included stability and excluded uniformity .

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL. 0 2717 3000-27 FAX. 0 2719 9484



NSG-TS-11517925
CALIBRATION 6008

Cert. No.: 22TM151
Page.: 1 of 3

Certificate of Calibration

Equipment : Hot Air Oven
Manufacturer : Binder
Model : FED 115 E2
Serial No. : 11-22823
ID No. : ERTC-L-In.-076
Submitted by : Environment Research & Technology Company Limited
25/114 Moo 6 Soi Chinakhet 1,
Ngamwongwan Road, Toongsonghong, Lakse,
Bangkok 10210
Location : Laboratory (ERTC)
Received Order : 5 January 2022
Calibration Date : 5 January 2022
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Man Pattanapongpaiboon
Approved by :
(/) Pornthippa Tameyakul
(/) Malee Butkruea
(/) Suwit Imjai

Issue Date : 21 January 2022
The Uncertainties are for a confidence probability of approximately 95 %

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services, 3 : Equipment Calibration and Testing Services.

a 1090217

A 0036818



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2201-0006ON-2
Cert. No.: 22TM151
Page.: 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD) and Thermocouple Type T.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument **Model** **Serial No.** **Cert. No.** **Due Date**
1) Data Acquisition 34970A MY44031769 21LM12 02 Sep 2022

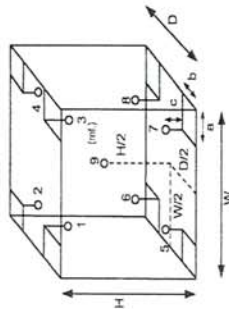
2. This certificate is valid only to the item calibrated on date and place of calibration.

3. This certification is traceable to the International System of Unit.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close



Probe Installation Details :

Dimension of Chamber :
a = 5.0 cm
b = 5.0 cm
c = 5.0 cm
D = 0.40 m
W = 0.60 m
H = 0.48 m
Capacity = 0.12 m³

Environment during calibration	
Temp. (°C)	27
REL.Humid. (%)	54
AC Supply (Volt)	219
Beginning	Finished
27	27
54	58
219	222

Ref. Std. ID No.: @ Calibration Point	
Position :	(180) °C
1	20-09TC-01
2	20-09TC-02
3	20-09TC-03
4	20-09TC-04
5	20-09TC-05
6	20-09TC-06
7	20-09TC-07
8	20-09TC-08
9 (ref.)	20-09TC-09

Ref. Std. ID No.: @ Calibration Point	
Position :	(104) °C
1	9RTD-2/1
2	9RTD-2/2
3	9RTD-2/3
4	9RTD-2/4
5	9RTD-2/5
6	9RTD-2/6
7	9RTD-2/7
8	9RTD-2/8
9 (ref.)	9RTD-2/9



Equipment : Hot Air Oven
Condition As-Received : Used Item
Reference : 2201-0006ON-2
Cert. No.: 22TM151
Page.: 3 of 3

Result of Calibration :-

Function of UUC* : Temperature Source

Fresh air setting : Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
104	104	104	0.11	1.1	1.4	0.69	2
180	180	180	0.43	3.3	5.6	1.5	2

Measured Temperature (°C)								
Position								
1	2	3	4	5	6	7	8	9 (ref.)
103.167	102.948	104.098	104.155	104.013	103.198	103.619	103.294	103.159
177.080	177.342	181.816	181.065	179.474	177.914	181.064	179.354	178.751

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor *k*, providing a level of confidence of approximately 95 %.

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ภาคผนวก 3ข

ผลตรวจวัดคุณภาพอากาศในบรรยากาศ

ANALYSIS REPORT

Customer Name : การพาณิชย์เทคโนโลยี
Address : เลขที่ 444 ถนนพหลโยธิน เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมรอบพื้นที่ 3 (ส่วนที่ 1 ผ.4)
Project Location : จังหวัดนนทบุรี
Sampling Source : Ambient Air Quality
Sampling Point : สถานี 1 : บริเวณพื้นที่ใกล้รั้วโครงการ
GPS. Coordinate : UTM (WGS84) 47P 0707860 E, 1442948 N
Sampling Date : November 17-22, 2022
Sampling Time : 09:55
Sampling Method : U.S. EPA 40 CFR Part 50, 53
Sampling By : Mr.Apiwat Chamnanweh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Folder No. : 2022-AE458
Received Date : November 23, 2022
Analytical Date : November 23-30, 2022
Report No. : 2022-RAA1323
Report Date : December 1, 2022

Parameter	Unit	Method of Analysis	Result					Standard ^{1*}	Standard ^{1*}
			Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22		
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.061	0.062	0.095	0.057	0.101	0.330	-
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.035	0.035	0.053	0.033	0.053	0.120	-
Particulate Size Less Than 2.5 Micron (PM2.5) 24 Hours Average	mg/m ³	PM2.5 Size Selective, Low-Volume, Gravimetric	0.017	0.019	0.026	0.020	0.024	-	0.05

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

^{2*} Notification of National Environmental Board, B.E.2565 (2022), published in the Royal Government Gazette No.139 Special Part 163D dated July 8, B.E.2565 (2022) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การพาณิชย์เทคโนโลยี
Address : เลขที่ 444 ถนนพหลโยธิน เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมรอบพื้นที่ 3 (ส่วนที่ 1 ผ.4)
Project Location : จังหวัดนนทบุรี
Sampling Source : Ambient Air Quality
Sampling Point : สถานี 2 : บริเวณโรงเรียนบ้านทุ่งทราย ตำบลบางละมุง อำเภอเมืองนนทบุรี จังหวัดนนทบุรี
GPS. Coordinate : UTM (WGS84) 47P 0708742 E, 1444282 N
Sampling Date : November 17-22, 2022
Sampling Time : 09:15
Sampling Method : U.S. EPA 40 CFR Part 50, 53
Sampling By : Mr.Apiwat Chamnanweh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Folder No. : 2022-AE458
Received Date : November 23, 2022
Analytical Date : November 23-30, 2022
Report No. : 2022-RAA1325
Report Date : December 1, 2022

Parameter	Unit	Method of Analysis	Result					Standard ^{1*}	Standard ^{1*}
			Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22		
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.103	0.117	0.128	0.093	0.202	0.330	-
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.064	0.068	0.075	0.051	0.109	0.120	-
Particulate Size Less Than 2.5 Micron (PM2.5) 24 Hours Average	mg/m ³	PM2.5 Size Selective, Low-Volume, Gravimetric	0.026	0.026	0.025	0.016	0.027	-	0.05

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 42D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

^{2*} Notification of National Environmental Board, B.E.2565 (2022), published in the Royal Government Gazette No.139 Special Part 163D dated July 8, B.E.2565 (2022) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การท่าเรือแห่งประเทศไทย
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าเรือแหลมฉบังระยะที่ 3 (ส่วนที่ 1 ก 4)
Project Location : จังหวัดชลบุรี
Sampling Source : Ambient Air Quality
Sampling Point : สถานี 3 : บริเวณท่าเรือพัฒนาท่าเรือแหลมฉบัง ส่วนบนระยะที่ 3
GPS. Coordinate : UTM (WGS84) 47P 0708145 E, 1442221 N
Sampling Date : November 17-22, 2022
Sampling Time : 08:45
Sampling Method : U.S. EPA 40 CFR Part 50, 53
Sampling By : Mr. Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Folder No. : 2022-AE458
Received Date : November 23, 2022
Analytical Date : November 23-30, 2022
Report No. : 2022-RAA3328
Report Date : December 1, 2022

Parameter	Unit	Method of Analysis	Result				Standard ¹⁾	Standard ²⁾
			Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22		
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.057	0.043	0.069	0.045	0.078	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.034	0.025	0.042	0.026	0.039	0.120
Particulate Size Less Than 2.5 Micron (PM2.5) 24 Hours Average	mg/m ³	PM2.5 Size Selective, Low-Volume, Gravimetric	0.016	0.016	0.022	0.012	0.020	0.05

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 43D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
²⁾ Notification of National Environmental Board, B.E.2565 (2022), published in the Royal Government Gazette No.139 Special Part 163D dated July 8, B.E.2565 (2022) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การท่าเรือแห่งประเทศไทย
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าเรือแหลมฉบังระยะที่ 3 (ส่วนที่ 1 ก 4)
Project Location : จังหวัดชลบุรี
Sampling Source : Ambient Air Quality
Sampling Point : สถานี 4 : บริเวณท่าเรือพัฒนาท่าเรือแหลมฉบัง ส่วนบนระยะที่ 3
GPS. Coordinate : UTM (WGS84) 47P 0709190 E, 1440410 N
Sampling Date : November 17-22, 2022
Sampling Time : 08:25
Sampling Method : U.S. EPA 40 CFR Part 50, 53
Sampling By : Mr. Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Folder No. : 2022-AE458
Received Date : November 23, 2022
Analytical Date : November 23-30, 2022
Report No. : 2022-RAA3329
Report Date : December 1, 2022

Parameter	Unit	Method of Analysis	Result				Standard ¹⁾	Standard ²⁾
			Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22		
Total Suspended Particulate (TSP) 24 Hours Average	mg/m ³	High-Volume, Gravimetric	0.051	0.045	0.070	0.042	0.070	0.330
Particulate Size Less Than 10 Micron (PM10) 24 Hours Average	mg/m ³	PM10 Size Selective, High-Volume, Gravimetric	0.032	0.029	0.047	0.028	0.043	0.120
Particulate Size Less Than 2.5 Micron (PM2.5) 24 Hours Average	mg/m ³	PM2.5 Size Selective, Low-Volume, Gravimetric	0.016	0.012	0.025	0.012	0.017	0.05

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 43D dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 104D dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
²⁾ Notification of National Environmental Board, B.E.2565 (2022), published in the Royal Government Gazette No.139 Special Part 163D dated July 8, B.E.2565 (2022) under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำสิ่งแวดล้อมเพื่อไทย
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าเรือแหลมฉบังระยะที่ 3 (ส่วนที่ 1 ก 4)
Project Location : จังหวัดชลบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 1 : บริเวณพื้นที่ก่อสร้างโครงการ
GPS. Coordinate : UTM (WGS84) 47P 0707860 E, 1442948 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer, Horiba Model APNA-370 Serial Number XPM57UJ3L

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-001 - 005
Report No. : 2022-RAAK041
Report Date : December 7, 2022

Interval Time	Result (ppm)												Standard ^{1*}
	Nov 17-18, 22	Nov 17-18, 22	Nov 18-19, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 20-21, 22	Nov 21-22, 22	Nov 21-22, 22	Nov 21-22, 22	Nov 21-22, 22	
10:00-11:00	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂
10:00-11:00	0.0076	0.0134	0.0210	0.0061	0.0094	0.0155	0.0057	0.0141	0.0198	0.0045	0.0082	0.0127	0.0066
11:00-12:00	0.0083	0.0163	0.0246	0.0153	0.0145	0.0298	0.0074	0.0174	0.0248	0.0017	0.0043	0.0060	0.0120
12:00-13:00	0.0116	0.0154	0.0270	0.0371	0.0245	0.0616	0.0102	0.0273	0.0375	0.0014	0.0054	0.0068	0.0051
13:00-14:00	0.0132	0.0185	0.0317	0.0125	0.0168	0.0293	0.0036	0.0195	0.0231	0.0014	0.0060	0.0074	0.0060
14:00-15:00	0.0240	0.0245	0.0485	0.0277	0.0237	0.0514	0.0037	0.0195	0.0232	0.0012	0.0065	0.0077	0.0071
15:00-16:00	0.0075	0.0147	0.0222	0.0101	0.0113	0.0214	0.0048	0.0229	0.0277	0.0013	0.0064	0.0077	0.0083
16:00-17:00	0.0190	0.0247	0.0437	0.0053	0.0107	0.0160	0.0110	0.0429	0.0539	0.0013	0.0061	0.0074	0.0078
17:00-18:00	0.0117	0.0228	0.0345	0.0087	0.0219	0.0306	0.0068	0.0273	0.0341	0.0012	0.0074	0.0086	0.0054
18:00-19:00	0.0043	0.0180	0.0223	0.0013	0.0150	0.0163	0.0022	0.0290	0.0312	0.0010	0.0111	0.0121	0.0024
19:00-20:00	0.0033	0.0164	0.0197	0.0017	0.0197	0.0214	0.0012	0.0253	0.0265	0.0009	0.0117	0.0126	0.0013
20:00-21:00	0.0145	0.0177	0.0322	0.0044	0.0204	0.0248	0.0051	0.0330	0.0381	0.0009	0.0113	0.0122	0.0015
21:00-22:00	0.0225	0.0191	0.0416	0.0069	0.0186	0.0255	0.0091	0.0275	0.0366	0.0010	0.0084	0.0094	0.0028
22:00-23:00	0.0163	0.0159	0.0322	0.0193	0.0234	0.0427	0.0077	0.0238	0.0305	0.0009	0.0049	0.0058	0.0050
23:00-00:00	0.0195	0.0163	0.0358	0.0296	0.0246	0.0542	0.0036	0.0179	0.0215	0.0009	0.0057	0.0066	0.0058
00:00-01:00	0.0332	0.0197	0.0549	0.0431	0.0260	0.0691	0.0151	0.0195	0.0346	0.0009	0.0056	0.0065	0.0073
01:00-02:00	0.0591	0.0231	0.0822	0.0345	0.0217	0.0562	0.0172	0.0187	0.0359	0.0010	0.0075	0.0085	0.0096
02:00-03:00	0.0427	0.0209	0.0636	0.0361	0.0193	0.0554	0.0084	0.0158	0.0242	0.0012	0.0105	0.0117	0.0141
03:00-04:00	0.0247	0.0162	0.0409	0.0302	0.0167	0.0469	0.0027	0.0135	0.0162	0.0013	0.0086	0.0099	0.0080
04:00-05:00	0.0203	0.0137	0.0340	0.0235	0.0153	0.0388	0.0040	0.0139	0.0179	0.0010	0.0058	0.0068	0.0110
05:00-06:00	0.0157	0.0122	0.0279	0.0228	0.0148	0.0376	0.0036	0.0133	0.0169	0.0015	0.0083	0.0098	0.0090
06:00-07:00	0.0228	0.0137	0.0365	0.0281	0.0169	0.0450	0.0033	0.0129	0.0162	0.0030	0.0120	0.0150	0.0034
07:00-08:00	0.0412	0.0190	0.0602	0.0306	0.0184	0.0490	0.0088	0.0140	0.0228	0.0099	0.0145	0.0244	0.0140
08:00-09:00	0.0390	0.0215	0.0605	0.0375	0.0229	0.0604	0.0102	0.0152	0.0254	0.0179	0.0173	0.0352	0.0196
09:00-10:00	0.0106	0.0146	0.0252	0.0242	0.0098	0.0051	0.0105	0.0156	0.0067	0.0114	0.0181	0.0119	0.0216
24 Hours Average	0.0206	0.0178	0.0384	0.0208	0.0188	0.0396	0.0087	0.0206	0.0273	0.0085	0.0112	0.0075	0.0194
1 Hour Maximum	0.0251	0.0247	0.0822	0.0431	0.0260	0.0691	0.0172	0.0429	0.0539	0.0179	0.0173	0.0357	0.0196
Standard ^{1*}													0.17

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.121 Special Part 1540 dated September 22, B.E.2547 (2004), under the Enforcement and Conservation of National Environmental Quality Standard Act.
^{2*} Notification No.21, B.E.2535 (1992), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.121 Special Part 1540 dated September 22, B.E.2547 (2004), under the Enforcement and Conservation of National Environmental Quality Standard Act.

ANALYSIS REPORT

Customer Name : การทำสิ่งแวดล้อมเพื่อไทย
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าเรือแหลมฉบังระยะที่ 3 (ส่วนที่ 1 ก 4)
Project Location : จังหวัดชลบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 1 : บริเวณพื้นที่ก่อสร้างโครงการ
GPS. Coordinate : UTM (WGS84) 47P 0707860 E, 1442948 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer, Thermo Model 43i Serial Number CH14430004

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-001 - 005
Report No. : 2022-RAAK045
Report Date : December 7, 2022

Interval Time	Result SO ₂ (ppm)												Standard
	Nov 17-18, 22	Nov 17-18, 22	Nov 18-19, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 20-21, 22	Nov 21-22, 22	Nov 21-22, 22	Nov 21-22, 22	Nov 21-22, 22	
10:00-11:00	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂	NO _x	NO ₂
10:00-11:00	0.0013	0.0013	0.0014	0.0014	0.0019	0.0019	0.0017	0.0017	0.0024	0.0024	0.0024	0.0024	0.0024
11:00-12:00	0.0013	0.0013	0.0014	0.0014	0.0020	0.0020	0.0017	0.0017	0.0021	0.0021	0.0021	0.0021	0.0031
12:00-13:00	0.0013	0.0013	0.0016	0.0016	0.0020	0.0020	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0048
13:00-14:00	0.0013	0.0013	0.0015	0.0015	0.0020	0.0020	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0042
14:00-15:00	0.0015	0.0015	0.0017	0.0017	0.0025	0.0025	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0034
15:00-16:00	0.0017	0.0017	0.0015	0.0015	0.0026	0.0026	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0036
16:00-17:00	0.0019	0.0019	0.0021	0.0021	0.0022	0.0022	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0025
17:00-18:00	0.0018	0.0018	0.0021	0.0021	0.0021	0.0021	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0035
18:00-19:00	0.0019	0.0019	0.0018	0.0018	0.0027	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0029
19:00-20:00	0.0019	0.0019	0.0016	0.0016	0.0029	0.0029	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0028
20:00-21:00	0.0020	0.0020	0.0018	0.0018	0.0042	0.0042	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0029
21:00-22:00	0.0021	0.0021	0.0022	0.0022	0.0027	0.0027	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0027
22:00-23:00	0.0017	0.0017	0.0024	0.0024	0.0021	0.0021	0.0017	0.0017	0.0030	0.0030	0.0030	0.0030	0.0030
23:00-00:00	0.0017	0.0017	0.0027	0.0027	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0026
00:00-01:00	0.0023	0.0023	0.0030	0.0030	0.0021	0.0021	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0030
01:00-02:00	0.0025	0.0025	0.0029	0.0029	0.0022	0.0022	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0031
02:00-03:00	0.0028	0.0028	0.0028	0.0028	0.0020	0.0020	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0030
03:00-04:00	0.0022	0.0022	0.0028	0.0028	0.0017	0.0017	0.0018	0.0018	0.0030	0.0030	0.0030	0.0030	0.0030
04:00-05:00	0.0021	0.0021	0.0033	0.0033	0.0017	0.0017	0.0020	0.0020	0.0029	0.0029	0.0029	0.0029	0.0029
05:00-06:00	0.0019	0.0019	0.0030	0.0030	0.0019	0.0019	0.0020	0.0020	0.0029	0.0029	0.0029	0.0029	0.0029
06:00-07:00	0.0022	0.0022	0.0031	0.0031	0.0018	0.0018	0.0020	0.0020	0.0029	0.0029	0.0029	0.0029	0.0029
07:00-08:00	0.0025	0.0025	0.0034	0.0034	0.0018	0.0018	0.0020	0.0020	0.0029	0.0029	0.0029	0.0029	0.0039
08:00-09:00	0.0024	0.0024	0.0028	0.0028	0.0029	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0038
09:00-10:00	0.0016	0.0016	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0028
24 Hours Average	0.0019	0.0019	0.0023	0.0023	0.0023	0.0023	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.12 ^{2*}
1 Hour Maximum	0.0025	0.0025	0.0034	0.0034	0.0042	0.0042	0.0027	0.0027	0.0048	0.0048	0.0048	0.0048	0.30 ^{2*}

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1540 dated September 22, B.E.2547 (2004), under the Enforcement and Conservation of National Environmental Quality Standard Act.
^{2*} Notification No.21, B.E.2535 (1992), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.121 Special Part 1540 dated September 22, B.E.2547 (2004), under the Enforcement and Conservation of National Environmental Quality Standard Act.

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนเทเกา แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการทำวิจัยสิ่งแวดล้อมระยะที่ 3 (ส่วนที่ 1 ผ 4)
Project Location : จังหวัดภูเก็ต
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 1 : บริเวณพื้นที่ก่อสร้างโรงการ
GPS, Coordinate : UTM (WGS84) 47P 0707860 E, 1442948 N
Measured Date : November 17-22, 2022
Measured By : Mr. Apiwat Channanweeh
Measured Instrument : CO NDIR Analyzer, Horiba Model APMA-370 Serial Number WNTLD9N8

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-001 - 005
Report No. : 2022-RAAK049
Report Date : December 7, 2022

Interval Time	Result CO (ppm)										Standard ¹
	Nov 17-18, 22		Nov 18-19, 22		Nov 19-20, 22		Nov 20-21, 22		Nov 21-22, 22		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
10:00-11:00	0.5	-	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.5	
11:00-12:00	0.5	-	0.7	0.6	0.9	0.8	0.7	0.6	0.7	0.5	
12:00-13:00	0.5	-	0.6	0.7	0.9	0.8	0.7	0.6	0.7	0.6	
13:00-14:00	0.5	-	0.7	0.7	0.8	0.8	0.6	0.7	0.7	0.6	
14:00-15:00	0.5	-	0.7	0.7	0.8	0.8	0.5	0.6	0.7	0.6	
15:00-16:00	0.3	-	0.4	0.6	0.6	0.8	0.5	0.6	0.7	0.7	
16:00-17:00	0.3	-	0.4	0.6	0.7	0.8	0.5	0.6	0.5	0.6	
17:00-18:00	0.4	0.4	0.4	0.6	0.6	0.8	0.5	0.6	0.5	0.6	
18:00-19:00	0.4	0.4	0.4	0.5	0.6	0.7	0.5	0.6	0.5	0.6	
19:00-20:00	0.4	0.4	0.4	0.5	0.8	0.7	0.4	0.5	0.5	0.6	
20:00-21:00	0.5	0.4	0.5	0.5	1.0	0.7	0.4	0.5	0.5	0.6	
21:00-22:00	0.6	0.4	0.7	0.5	0.9	0.8	0.3	0.4	0.6	0.6	
22:00-23:00	0.5	0.4	0.7	0.5	0.7	0.7	0.3	0.4	0.6	0.6	
23:00-00:00	0.6	0.5	0.8	0.5	0.6	0.7	0.3	0.4	0.6	0.5	
00:00-01:00	0.8	0.5	0.8	0.6	0.7	0.7	0.3	0.4	0.6	0.6	
01:00-02:00	0.7	0.6	0.7	0.6	0.6	0.7	0.3	0.4	0.6	0.6	
02:00-03:00	0.6	0.6	0.8	0.7	0.6	0.7	0.4	0.3	0.6	0.6	
03:00-04:00	0.6	0.6	0.6	0.7	0.5	0.7	0.4	0.3	0.5	0.6	
04:00-05:00	0.5	0.6	0.7	0.7	0.5	0.6	0.4	0.3	0.5	0.6	
05:00-06:00	0.5	0.6	0.6	0.7	0.5	0.6	0.4	0.4	0.6	0.6	
06:00-07:00	0.6	0.6	0.7	0.7	0.6	0.6	0.4	0.4	0.7	0.6	
07:00-08:00	0.8	0.6	0.8	0.7	0.6	0.6	0.5	0.4	0.8	0.6	
08:00-09:00	0.7	0.6	0.9	0.7	0.7	0.6	0.7	0.4	0.9	0.6	
09:00-10:00	0.7	0.6	0.8	0.7	0.7	0.6	0.6	0.5	0.8	0.7	
24 Hours Average	0.5	-	0.6	-	0.7	-	0.5	-	0.6	-	-
1 Hour Maximum	0.8	-	0.9	-	1.0	-	0.7	-	0.9	-	30
8 Hours Maximum	-	0.6	-	0.7	-	0.8	-	0.7	-	0.7	9

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนเทเกา แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการทำวิจัยสิ่งแวดล้อมระยะที่ 3 (ส่วนที่ 1 ผ 4)
Project Location : จังหวัดภูเก็ต
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 2 : บริเวณพื้นที่ก่อสร้างสำนักงานของ จังหวัดภูเก็ต
GPS, Coordinate : UTM (WGS84) 47P 0708742 E, 1444282 N
Measured Date : November 17-22, 2022
Measured By : Mr. Apiwat Channanweeh
Measured Instrument : NOx Chemiluminescence Analyzer, Horiba Model APMA-370 Serial Number NKOVYRX

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-006 - 010
Report No. : 2022-RAAK042
Report Date : December 7, 2022

Interval Time	Result (ppm)												Standard ¹			
	Nov 17-18, 22			Nov 18-19, 22			Nov 19-20, 22			Nov 20-21, 22				Nov 21-22, 22		
	NO	NO ₂	NOx	NO	NO ₂	NOx	NO	NO ₂	NOx	NO	NO ₂	NOx		NO	NO ₂	NOx
09:00-10:00	0.0098	0.0122	0.0220	0.0233	0.0064	0.0297	0.0568	0.0123	0.0691	0.0105	0.0127	0.0232	0.0252	0.0097	0.0349	
10:00-11:00	0.0126	0.0065	0.0191	0.0131	0.0067	0.0198	0.0138	0.0113	0.0251	0.0097	0.0268	0.0365	0.0162	0.0094	0.0236	
11:00-12:00	0.0086	0.0076	0.0162	0.0103	0.0103	0.0236	0.0086	0.0184	0.0270	0.0101	0.0286	0.0387	0.0159	0.0143	0.0302	
12:00-13:00	0.0094	0.0166	0.0260	0.0102	0.0244	0.0081	0.0344	0.0425	0.0101	0.0591	0.0692	0.0087	0.0301	0.0388		
13:00-14:00	0.0066	0.0237	0.0303	0.0072	0.0237	0.0309	0.0048	0.0383	0.0431	0.0062	0.0400	0.0462	0.0112	0.0517	0.0649	
14:00-15:00	0.0054	0.0348	0.0402	0.0090	0.0329	0.0419	0.0036	0.0323	0.0359	0.0059	0.0204	0.0263	0.0077	0.0377	0.0454	
15:00-16:00	0.0058	0.0461	0.0519	0.0044	0.0364	0.0408	0.0045	0.0382	0.0427	0.0058	0.0207	0.0265	0.0054	0.0218	0.0272	
16:00-17:00	0.0408	0.0311	0.0719	0.0258	0.0253	0.0511	0.0032	0.0315	0.0347	0.0033	0.0193	0.0226	0.0043	0.0287	0.0330	
17:00-18:00	0.0388	0.0161	0.0549	0.0338	0.0257	0.0595	0.0024	0.0296	0.0320	0.0048	0.0200	0.0248	0.0043	0.0352	0.0395	
18:00-19:00	0.0531	0.0169	0.0700	0.0372	0.0246	0.0618	0.0022	0.0342	0.0364	0.0102	0.0222	0.0324	0.0037	0.0258	0.0295	
19:00-20:00	0.0428	0.0150	0.0578	0.0350	0.0204	0.0554	0.0184	0.0468	0.0652	0.0198	0.0219	0.0417	0.0043	0.0254	0.0297	
20:00-21:00	0.0735	0.0203	0.0938	0.0514	0.0180	0.0694	0.0516	0.0447	0.0963	0.0160	0.0176	0.0336	0.0189	0.0269	0.0458	
21:00-22:00	0.0683	0.0160	0.0843	0.0553	0.0176	0.0729	0.0490	0.0329	0.0819	0.0089	0.0091	0.0180	0.0378	0.0300	0.0678	
22:00-23:00	0.0576	0.0118	0.0694	0.0633	0.0176	0.0809	0.0278	0.0232	0.0510	0.0070	0.0074	0.0144	0.0325	0.0237	0.0582	
23:00-00:00	0.0592	0.0109	0.0701	0.0794	0.0179	0.0973	0.0327	0.0213	0.0540	0.0063	0.0062	0.0125	0.0293	0.0219	0.0512	
00:00-01:00	0.0803	0.0128	0.0931	0.0815	0.0158	0.0973	0.0432	0.0192	0.0624	0.0031	0.0050	0.0081	0.0385	0.0196	0.0581	
01:00-02:00	0.0876	0.0134	0.1010	0.0749	0.0138	0.0887	0.0398	0.0171	0.0569	0.0014	0.0043	0.0057	0.0370	0.0176	0.0246	
02:00-03:00	0.0679	0.0108	0.0787	0.0771	0.0128	0.0899	0.0175	0.0149	0.0324	0.0010	0.0031	0.0041	0.0269	0.0164	0.0433	
03:00-04:00	0.0495	0.0083	0.0578	0.0555	0.0103	0.0658	0.0183	0.0147	0.0330	0.0018	0.0030	0.0048	0.0292	0.0156	0.0448	
04:00-05:00	0.0485	0.0077	0.0562	0.0512	0.0094	0.0606	0.0217	0.0145	0.0362	0.0045	0.0043	0.0088	0.0409	0.0162	0.0571	
05:00-06:00	0.0551	0.0081	0.0632	0.0535	0.0090	0.0625	0.0223	0.0137	0.0360	0.0089	0.0052	0.0141	0.0188	0.0603		
06:00-07:00	0.0781	0.0101	0.0882	0.0734	0.0115	0.0849	0.0370	0.0140	0.0510	0.0275	0.0079	0.0354	0.0617	0.0248	0.0865	
07:00-08:00	0.0842	0.0169	0.1011	0.0918	0.0128	0.1046	0.0540	0.0164	0.0704	0.0635	0.0120	0.0755	0.0657	0.0366	0.0923	
08:00-09:00	0.0863	0.0127	0.0990	0.0898	0.0133	0.1031	0.0448	0.0157	0.0605	0.0170	0.0130	0.0840	0.0621	0.0246	0.0867	
24 Hours Average	0.0471	0.0161	0.0632	0.0463	0.0169	0.0632	0.0244	0.0246	0.0490	0.0132	0.0162	0.0384	0.0282	0.0239	0.0501	
1 Hour Maximum	0.0876	0.0461	0.1011	0.0918	0.0364	0.1046	0.0568	0.0468	0.0963	0.0710	0.0591	0.0840	0.0657	0.0357	0.0923	

Remark : ¹ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992).

ANALYSIS REPORT

Customer Name : การทำสิ่งแวดล้อมเพื่อไทย
Address : เลขที่ 444 ถนนพหลโยธิน เขตจตุจักร กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าอากาศยานดอนเมือง ระยะที่ 3 (ส่วนที่ 1 ฝั่ง 4)
Project Location : จังหวัดนนทบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานี 2 : บริเวณโถงรับผู้โดยสาร ท่าอากาศยานดอนเมือง จังหวัดนนทบุรี
GPS. Coordinate : UTM (WGS84) 47P 0708742 E, 1444282 N
Measured Date : November 17-22, 2022
Measured By : Mr. Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer, Thermo Model 43i Serial Number CM14430002

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-006 - 010
Report No. : 2022-RAAK046
Report Date : December 7, 2022

Interval Time	Result SO ₂ (ppm)					Standard
	Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22	
09:00-10:00	0.0023	0.0023	0.0038	0.0021	0.0020	0.12 ¹ 0.30 ²
10:00-11:00	0.0024	0.0019	0.0025	0.0016	0.0015	
11:00-12:00	0.0018	0.0018	0.0023	0.0018	0.0021	
12:00-13:00	0.0021	0.0019	0.0022	0.0017	0.0016	
13:00-14:00	0.0022	0.0019	0.0024	0.0017	0.0015	
14:00-15:00	0.0023	0.0019	0.0024	0.0017	0.0016	
15:00-16:00	0.0023	0.0018	0.0020	0.0018	0.0018	
16:00-17:00	0.0024	0.0033	0.0024	0.0019	0.0016	
17:00-18:00	0.0029	0.0042	0.0024	0.0020	0.0017	
18:00-19:00	0.0036	0.0041	0.0022	0.0021	0.0016	
19:00-20:00	0.0038	0.0033	0.0036	0.0025	0.0016	
20:00-21:00	0.0044	0.0041	0.0044	0.0023	0.0020	
21:00-22:00	0.0045	0.0039	0.0047	0.0019	0.0024	
22:00-23:00	0.0042	0.0042	0.0028	0.0017	0.0022	
23:00-00:00	0.0043	0.0045	0.0025	0.0017	0.0021	
00:00-01:00	0.0053	0.0050	0.0036	0.0017	0.0022	
01:00-02:00	0.0048	0.0057	0.0030	0.0017	0.0022	
02:00-03:00	0.0040	0.0044	0.0022	0.0017	0.0019	
03:00-04:00	0.0037	0.0038	0.0023	0.0014	0.0020	
04:00-05:00	0.0041	0.0043	0.0023	0.0015	0.0020	
05:00-06:00	0.0042	0.0056	0.0024	0.0018	0.0021	
06:00-07:00	0.0048	0.0056	0.0027	0.0020	0.0027	
07:00-08:00	0.0050	0.0058	0.0032	0.0032	0.0039	
08:00-09:00	0.0045	0.0053	0.0041	0.0034	0.0033	
24 Hours Average	0.0036	0.0038	0.0028	0.0020	0.0021	
1 Hour Maximum	0.0053	0.0058	0.0047	0.0034	0.0039	

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
²⁾ Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.112 Special Part 2770 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 390 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำสิ่งแวดล้อมเพื่อไทย
Address : เลขที่ 444 ถนนพหลโยธิน เขตจตุจักร กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาท่าอากาศยานดอนเมือง ระยะที่ 3 (ส่วนที่ 1 ฝั่ง 4)
Project Location : จังหวัดนนทบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานี 2 : บริเวณโถงรับผู้โดยสาร ท่าอากาศยานดอนเมือง จังหวัดนนทบุรี
GPS. Coordinate : UTM (WGS84) 47P 0708742 E, 1444282 N
Measured Date : November 17-22, 2022
Measured By : Mr. Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer, Horiba Model APMA-370 Serial Number XRP3Y7LA

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-006 - 010
Report No. : 2022-RAAK030
Report Date : December 7, 2022

Interval Time	Result CO (ppm)										Standard ¹⁾
	Nov 17-18, 22		Nov 18-19, 22		Nov 19-20, 22		Nov 20-21, 22		Nov 21-22, 22		
	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	1 hr Avg	8 hr Avg	
09:00-10:00	0.7	-	0.8	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4
10:00-11:00	0.7	-	0.8	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.4
11:00-12:00	0.8	-	0.7	0.7	0.7	0.6	0.5	0.4	0.5	0.5	0.5
12:00-13:00	0.8	-	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5
13:00-14:00	0.8	-	0.7	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.5
14:00-15:00	0.7	-	0.7	0.8	0.6	0.7	0.4	0.5	0.5	0.5	0.5
15:00-16:00	0.5	-	0.3	0.7	0.6	0.7	0.4	0.5	0.4	0.4	0.5
16:00-17:00	0.6	0.7	0.3	0.6	0.7	0.6	0.4	0.5	0.4	0.4	0.5
17:00-18:00	0.4	0.7	0.3	0.6	0.7	0.7	0.4	0.5	0.4	0.4	0.5
18:00-19:00	0.5	0.6	0.4	0.5	0.6	0.7	0.4	0.5	0.4	0.4	0.4
19:00-20:00	0.5	0.6	0.4	0.5	0.9	0.7	0.5	0.5	0.4	0.4	0.4
20:00-21:00	0.8	0.6	0.6	0.5	1.1	0.7	0.4	0.4	0.5	0.4	0.4
21:00-22:00	0.7	0.6	0.5	0.4	1.0	0.8	0.3	0.4	0.6	0.4	0.4
22:00-23:00	0.7	0.6	0.6	0.4	0.7	0.8	0.3	0.4	0.6	0.5	0.5
23:00-00:00	0.8	0.6	0.6	0.5	0.6	0.8	0.4	0.4	0.5	0.5	0.5
00:00-01:00	0.7	0.6	0.6	0.5	0.7	0.8	0.3	0.4	0.5	0.5	0.5
01:00-02:00	0.6	0.7	0.7	0.6	0.5	0.8	0.3	0.4	0.4	0.5	0.5
02:00-03:00	0.4	0.6	0.4	0.6	0.4	0.7	0.3	0.4	0.4	0.4	0.5
03:00-04:00	0.4	0.6	0.3	0.5	0.3	0.7	0.3	0.3	0.3	0.5	0.5
04:00-05:00	0.4	0.6	0.3	0.5	0.3	0.6	0.3	0.3	0.3	0.4	0.4
05:00-06:00	0.4	0.6	0.4	0.5	0.3	0.5	0.3	0.3	0.3	0.4	0.4
06:00-07:00	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.7	0.4	0.4
07:00-08:00	0.9	0.6	0.7	0.5	0.6	0.4	0.6	0.3	0.9	0.5	0.5
08:00-09:00	0.8	0.6	0.9	0.5	0.7	0.4	0.8	0.4	0.8	0.5	0.5
24 Hours Average	0.6	-	0.5	-	0.6	-	0.4	-	0.5	-	-
1 Hour Maximum	0.9	-	0.9	-	1.1	-	0.8	-	0.9	-	30
8 Hours Maximum	-	0.7	-	0.8	-	0.8	-	0.5	-	0.5	9

Remark : ¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมเมืองระยอง 3 (ส่วนที่ 1 ของ 4)
Project Location : จังหวัดระยอง
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 3 : บริเวณหน้าสำนักงานเทศบาลตำบลบางกะจะ จังหวัดระยอง
GPS. Coordinate : UTM (WGS84) 47P 0708145 E, 1442221 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : NOx Chemiluminescence Analyzer, Horiba Model APNA-370 Serial Number TMTLC359

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-011 - 015
Report No. : 2022-RAAK043
Report Date : December 7, 2022

Interval Time	Result (ppm)												Standard ^{1*}
	Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22	Nov 22-23, 22	Nov 23-24, 22	Nov 24-25, 22	Nov 25-26, 22	Nov 26-27, 22	Nov 27-28, 22	Nov 28-29, 22	
09:00-10:00	NO 0.135	NOx 0.201	NO 0.135	NOx 0.201	NO 0.135	NOx 0.201	NO 0.135	NOx 0.201	NO 0.135	NOx 0.201	NO 0.135	NOx 0.201	NO _x 0.218
10:00-11:00	NO 0.115	NOx 0.174	NO 0.115	NOx 0.174	NO 0.115	NOx 0.174	NO 0.115	NOx 0.174	NO 0.115	NOx 0.174	NO 0.115	NOx 0.174	NO _x 0.205
11:00-12:00	NO 0.103	NOx 0.167	NO 0.103	NOx 0.167	NO 0.103	NOx 0.167	NO 0.103	NOx 0.167	NO 0.103	NOx 0.167	NO 0.103	NOx 0.167	NO _x 0.201
12:00-13:00	NO 0.053	NOx 0.134	NO 0.053	NOx 0.134	NO 0.053	NOx 0.134	NO 0.053	NOx 0.134	NO 0.053	NOx 0.134	NO 0.053	NOx 0.134	NO _x 0.132
13:00-14:00	NO 0.047	NOx 0.103	NO 0.047	NOx 0.103	NO 0.047	NOx 0.103	NO 0.047	NOx 0.103	NO 0.047	NOx 0.103	NO 0.047	NOx 0.103	NO _x 0.089
14:00-15:00	NO 0.043	NOx 0.140	NO 0.043	NOx 0.140	NO 0.043	NOx 0.140	NO 0.043	NOx 0.140	NO 0.043	NOx 0.140	NO 0.043	NOx 0.140	NO _x 0.070
15:00-16:00	NO 0.031	NOx 0.131	NO 0.031	NOx 0.131	NO 0.031	NOx 0.131	NO 0.031	NOx 0.131	NO 0.031	NOx 0.131	NO 0.031	NOx 0.131	NO _x 0.081
16:00-17:00	NO 0.028	NOx 0.108	NO 0.028	NOx 0.108	NO 0.028	NOx 0.108	NO 0.028	NOx 0.108	NO 0.028	NOx 0.108	NO 0.028	NOx 0.108	NO _x 0.084
17:00-18:00	NO 0.038	NOx 0.200	NO 0.038	NOx 0.200	NO 0.038	NOx 0.200	NO 0.038	NOx 0.200	NO 0.038	NOx 0.200	NO 0.038	NOx 0.200	NO _x 0.036
18:00-19:00	NO 0.055	NOx 0.222	NO 0.055	NOx 0.222	NO 0.055	NOx 0.222	NO 0.055	NOx 0.222	NO 0.055	NOx 0.222	NO 0.055	NOx 0.222	NO _x 0.022
19:00-20:00	NO 0.057	NOx 0.207	NO 0.057	NOx 0.207	NO 0.057	NOx 0.207	NO 0.057	NOx 0.207	NO 0.057	NOx 0.207	NO 0.057	NOx 0.207	NO _x 0.022
20:00-21:00	NO 0.189	NOx 0.213	NO 0.189	NOx 0.213	NO 0.189	NOx 0.213	NO 0.189	NOx 0.213	NO 0.189	NOx 0.213	NO 0.189	NOx 0.213	NO _x 0.026
21:00-22:00	NO 0.342	NOx 0.211	NO 0.342	NOx 0.211	NO 0.342	NOx 0.211	NO 0.342	NOx 0.211	NO 0.342	NOx 0.211	NO 0.342	NOx 0.211	NO _x 0.032
22:00-23:00	NO 0.286	NOx 0.228	NO 0.286	NOx 0.228	NO 0.286	NOx 0.228	NO 0.286	NOx 0.228	NO 0.286	NOx 0.228	NO 0.286	NOx 0.228	NO _x 0.043
23:00-00:00	NO 0.243	NOx 0.159	NO 0.243	NOx 0.159	NO 0.243	NOx 0.159	NO 0.243	NOx 0.159	NO 0.243	NOx 0.159	NO 0.243	NOx 0.159	NO _x 0.036
00:00-01:00	NO 0.488	NOx 0.161	NO 0.488	NOx 0.161	NO 0.488	NOx 0.161	NO 0.488	NOx 0.161	NO 0.488	NOx 0.161	NO 0.488	NOx 0.161	NO _x 0.034
01:00-02:00	NO 0.585	NOx 0.158	NO 0.585	NOx 0.158	NO 0.585	NOx 0.158	NO 0.585	NOx 0.158	NO 0.585	NOx 0.158	NO 0.585	NOx 0.158	NO _x 0.034
02:00-03:00	NO 0.597	NOx 0.155	NO 0.597	NOx 0.155	NO 0.597	NOx 0.155	NO 0.597	NOx 0.155	NO 0.597	NOx 0.155	NO 0.597	NOx 0.155	NO _x 0.034
03:00-04:00	NO 0.403	NOx 0.150	NO 0.403	NOx 0.150	NO 0.403	NOx 0.150	NO 0.403	NOx 0.150	NO 0.403	NOx 0.150	NO 0.403	NOx 0.150	NO _x 0.033
04:00-05:00	NO 0.292	NOx 0.147	NO 0.292	NOx 0.147	NO 0.292	NOx 0.147	NO 0.292	NOx 0.147	NO 0.292	NOx 0.147	NO 0.292	NOx 0.147	NO _x 0.046
05:00-06:00	NO 0.259	NOx 0.115	NO 0.259	NOx 0.115	NO 0.259	NOx 0.115	NO 0.259	NOx 0.115	NO 0.259	NOx 0.115	NO 0.259	NOx 0.115	NO _x 0.038
06:00-07:00	NO 0.296	NOx 0.110	NO 0.296	NOx 0.110	NO 0.296	NOx 0.110	NO 0.296	NOx 0.110	NO 0.296	NOx 0.110	NO 0.296	NOx 0.110	NO _x 0.032
07:00-08:00	NO 0.546	NOx 0.120	NO 0.546	NOx 0.120	NO 0.546	NOx 0.120	NO 0.546	NOx 0.120	NO 0.546	NOx 0.120	NO 0.546	NOx 0.120	NO _x 0.044
08:00-09:00	NO 0.480	NOx 0.165	NO 0.480	NOx 0.165	NO 0.480	NOx 0.165	NO 0.480	NOx 0.165	NO 0.480	NOx 0.165	NO 0.480	NOx 0.165	NO _x 0.038
24 Hours Average	NO 0.537	NOx 0.227	NO 0.537	NOx 0.227	NO 0.537	NOx 0.227	NO 0.537	NOx 0.227	NO 0.537	NOx 0.227	NO 0.537	NOx 0.227	NO _x 0.17
1 Hour Maximum	NO 0.597	NOx 0.227	NO 0.597	NOx 0.227	NO 0.597	NOx 0.227	NO 0.597	NOx 0.227	NO 0.597	NOx 0.227	NO 0.597	NOx 0.227	NO _x 0.17

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), Notification No.28, B.E.2550 (2007), published in the Royal Government Gazette No.124 Special Part 380 dated May 14, B.E.2550 (2007) and Notification No.31, B.E.2552 (2009), published in the Royal Government Gazette No.128 Special Part 1140 dated August 14, B.E.2552 (2009), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมเมืองระยอง 3 (ส่วนที่ 1 ของ 4)
Project Location : จังหวัดระยอง
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 3 : บริเวณหน้าสำนักงานเทศบาลตำบลบางกะจะ จังหวัดระยอง
GPS. Coordinate : UTM (WGS84) 47P 0708145 E, 1442221 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO₂ UV-Fluorescence Analyzer, Thermo Model 43i Serial Number CM14330003

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-011 - 015
Report No. : 2022-RAAK047
Report Date : December 7, 2022

Interval Time	Result SO ₂ (ppm)												Standard
	Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22	Nov 22-23, 22	Nov 23-24, 22	Nov 24-25, 22	Nov 25-26, 22	Nov 26-27, 22	Nov 27-28, 22	Nov 28-29, 22	
09:00-10:00	0.0027	0.0022	0.0022	0.0026	0.0026	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
10:00-11:00	0.0025	0.0019	0.0019	0.0025	0.0025	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
11:00-12:00	0.0026	0.0019	0.0019	0.0026	0.0026	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
12:00-13:00	0.0029	0.0020	0.0020	0.0025	0.0025	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0020
13:00-14:00	0.0025	0.0020	0.0020	0.0046	0.0046	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
14:00-15:00	0.0023	0.0034	0.0034	0.0045	0.0045	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0014
15:00-16:00	0.0021	0.0014	0.0014	0.0044	0.0044	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0015
16:00-17:00	0.0012	0.0012	0.0012	0.0036	0.0036	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0050
17:00-18:00	0.0012	0.0013	0.0013	0.0048	0.0048	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0045
18:00-19:00	0.0013	0.0014	0.0014	0.0046	0.0046	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0048
19:00-20:00	0.0014	0.0012	0.0012	0.0031	0.0031	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0039
20:00-21:00	0.0017	0.0014	0.0014	0.0023	0.0023	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037
21:00-22:00	0.0022	0.0014	0.0014	0.0023	0.0023	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
22:00-23:00	0.0021	0.0020	0.0020	0.0026	0.0026	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0019
23:00-00:00	0.0018	0.0022	0.0022	0.0022	0.0022	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0019
00:00-01:00	0.0022	0.0029	0.0029	0.0023	0.0023	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
01:00-02:00	0.0029	0.0025	0.0025	0.0020	0.0020	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0027
02:00-03:00	0.0029	0.0025	0.0025	0.0020	0.0020	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0022
03:00-04:00	0.0026	0.0035	0.0035	0.0016	0.0016	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
04:00-05:00	0.0021	0.0034	0.0034	0.0016	0.0016	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0022
05:00-06:00	0.0017	0.0030	0.0030	0.0017	0.0017	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0022
06:00-07:00	0.0016	0.0025	0.0025	0.0017	0.0017	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0022
07:00-08:00	0.0028	0.0025	0.0025	0.0017	0.0017	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0028
08:00-09:00	0.0025	0.0025	0.0025	0.0017	0.0017	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0029
24 Hours Average	0.0022	0.0022	0.0022	0.0029	0.0029	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.12 ^{1*}
1 Hour Maximum	0.0029	0.0035	0.0035	0.0055	0.0055	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.30 ^{1*}

Remark : ^{1*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1040 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
^{2*} Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.113 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.31, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 390 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนห้ากิโล แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมบริเวณพื้นที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดชลบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 4 : บริเวณประตูทางออกด้านบางละมุง อำเภอเมืองชลบุรี จังหวัดชลบุรี
GPS. Coordinate : UTM (WGS84) 47P 0709190 E, 1440410 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : SO_x UV-Fluorescence Analyzer, Horiba Model APSA-370 Serial Number 12EBX34P

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-016 - 020
Report No. : 2022-RAAK048
Report Date : December 7, 2022

Interval Time	Result SO _x (ppm)					Standard
	Nov 17-18, 22	Nov 18-19, 22	Nov 19-20, 22	Nov 20-21, 22	Nov 21-22, 22	
08:00-09:00	0.0018	0.0016	0.0016	0.0014	0.0014	
09:00-10:00	0.0017	0.0016	0.0016	0.0014	0.0014	
10:00-11:00	0.0016	0.0017	0.0016	0.0016	0.0014	
11:00-12:00	0.0016	0.0017	0.0017	0.0017	0.0016	
12:00-13:00	0.0016	0.0017	0.0017	0.0017	0.0016	
13:00-14:00	0.0016	0.0017	0.0016	0.0017	0.0016	
14:00-15:00	0.0016	0.0016	0.0016	0.0017	0.0016	
15:00-16:00	0.0014	0.0016	0.0016	0.0016	0.0016	
16:00-17:00	0.0014	0.0014	0.0016	0.0016	0.0016	
17:00-18:00	0.0014	0.0014	0.0016	0.0016	0.0016	
18:00-19:00	0.0014	0.0014	0.0016	0.0016	0.0016	
19:00-20:00	0.0013	0.0014	0.0016	0.0016	0.0014	
20:00-21:00	0.0014	0.0014	0.0017	0.0016	0.0014	
21:00-22:00	0.0014	0.0016	0.0017	0.0014	0.0014	
22:00-23:00	0.0014	0.0016	0.0017	0.0014	0.0016	
23:00-00:00	0.0014	0.0016	0.0016	0.0014	0.0016	
00:00-01:00	0.0014	0.0016	0.0016	0.0014	0.0016	
01:00-02:00	0.0016	0.0016	0.0016	0.0014	0.0016	
02:00-03:00	0.0017	0.0014	0.0014	0.0014	0.0016	
03:00-04:00	0.0016	0.0016	0.0014	0.0013	0.0016	
04:00-05:00	0.0014	0.0014	0.0014	0.0013	0.0016	
05:00-06:00	0.0016	0.0016	0.0014	0.0014	0.0016	
06:00-07:00	0.0016	0.0014	0.0014	0.0014	0.0016	
07:00-08:00	0.0014	0.0014	0.0014	0.0014	0.0016	
24 Hours Average	0.0015	0.0015	0.0016	0.0015	0.0015	
1 Hour Maximum	0.0018	0.0017	0.0017	0.0017	0.0016	

Remark : 1¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995) and Notification No.24, B.E.2547 (2004), published in the Royal Government Gazette No.121 Special Part 1940 dated September 22, B.E.2547 (2004), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).
2²⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Special Part 270 dated July 13, B.E.2538 (1995) and Notification No.21, B.E.2544 (2001), published in the Royal Government Gazette No.118 Special Part 390 dated April 30, B.E.2544 (2001), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนห้ากิโล แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมบริเวณพื้นที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดชลบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานีที่ 4 : บริเวณประตูทางออกด้านบางละมุง อำเภอเมืองชลบุรี จังหวัดชลบุรี
GPS. Coordinate : UTM (WGS84) 47P 0709190 E, 1440410 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Channanweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Measured Instrument : CO NDIR Analyzer, Horiba Model APMA-370 Serial Number GFB0BLNC

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-016 - 020
Report No. : 2022-RAAK052
Report Date : December 7, 2022

Interval Time	Result CO (ppm)										Standard ¹⁾
	Nov 17-18, 22 1 hr Avg 8 hr Avg	Nov 18-19, 22 1 hr Avg 8 hr Avg	Nov 19-20, 22 1 hr Avg 8 hr Avg	Nov 20-21, 22 1 hr Avg 8 hr Avg	Nov 21-22, 22 1 hr Avg 8 hr Avg						
08:00-09:00	0.6	-	0.7	0.7	0.7	0.6	0.7	0.6	0.8	0.5	
09:00-10:00	0.7	-	0.5	0.7	0.7	0.6	0.5	0.6	0.5	0.5	
10:00-11:00	0.6	-	0.4	0.6	0.5	0.6	0.4	0.6	0.4	0.5	
11:00-12:00	0.5	-	0.4	0.6	0.4	0.6	0.4	0.5	0.4	0.5	
12:00-13:00	0.4	-	0.4	0.6	0.5	0.6	0.4	0.5	0.4	0.5	
13:00-14:00	0.4	-	0.3	0.5	0.5	0.6	0.4	0.5	0.4	0.5	
14:00-15:00	0.4	-	0.3	0.5	0.5	0.6	0.4	0.5	0.4	0.5	
15:00-16:00	0.4	0.5	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.5	
16:00-17:00	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	
17:00-18:00	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	
18:00-19:00	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	
19:00-20:00	0.6	0.4	0.6	0.4	0.5	0.5	0.5	0.4	0.6	0.4	
20:00-21:00	0.6	0.5	0.7	0.4	0.9	0.6	0.5	0.4	0.5	0.4	
21:00-22:00	0.7	0.5	0.7	0.5	1.0	0.6	0.4	0.4	0.7	0.5	
22:00-23:00	0.7	0.6	0.7	0.5	0.8	0.6	0.4	0.4	0.7	0.5	
23:00-00:00	0.7	0.6	0.7	0.6	0.7	0.7	0.4	0.4	0.6	0.6	
00:00-01:00	0.7	0.6	0.8	0.6	0.7	0.7	0.4	0.4	0.7	0.6	
01:00-02:00	0.8	0.7	0.6	0.7	0.6	0.7	0.4	0.4	0.6	0.6	
02:00-03:00	0.9	0.7	0.7	0.7	0.6	0.7	0.4	0.4	0.6	0.6	
03:00-04:00	0.6	0.7	0.7	0.7	0.5	0.7	0.4	0.4	0.6	0.6	
04:00-05:00	0.6	0.7	0.6	0.7	0.5	0.7	0.4	0.4	0.6	0.6	
05:00-06:00	0.6	0.7	0.5	0.7	0.6	0.6	0.5	0.4	0.6	0.6	
06:00-07:00	0.7	0.7	0.5	0.6	0.6	0.6	0.5	0.4	0.7	0.6	
07:00-08:00	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.4	0.8	0.6	
24 Hours Average	0.6	-	0.5	-	0.6	-	0.4	-	0.6	-	-
1 Hour Maximum	0.9	-	0.8	-	1.0	-	0.7	-	0.8	-	30
8 Hours Maximum	-	0.7	-	0.7	-	0.7	-	0.6	-	0.6	9

Remark : 1¹⁾ Notification of National Environmental Board, No.10, B.E.2538 (1995), published in the Royal Government Gazette No.112 Part 420 dated May 25, B.E.2538 (1995), under the Enhancement and Conservation of National Environmental Quality Act B.E.2535 (1992).

ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมระดับพื้นที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดนนทบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานี 1 : บริเวณพื้นที่ก่อสร้างโครงการ
GPS. Coordinate : UTM (WGS84) 47P 0707858 E, 1442972 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-001 - 005
Report No. : 2022-BAK036
Report Date : December 7, 2022

Date/Time	Nov 17-18, 22		Nov 18-19, 22		Nov 19-20, 22		Nov 20-21, 22		Nov 21-22, 22	
	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
10:00-11:00	1.3	NE	1.3	SSW	2.7	N	3.1	NNW	2.7	N
11:00-12:00	2.7	WSW	3.1	WSW	3.6	NNW	3.1	NNE	2.7	NNW
12:00-13:00	3.6	WSW	4.0	WSW	3.6	NNW	2.7	NNE	3.6	NNW
13:00-14:00	4.0	WSW	3.1	W	4.5	WNW	2.2	N	2.7	N
14:00-15:00	4.5	WSW	4.0	W	3.6	NNW	2.2	N	2.7	N
15:00-16:00	3.6	SW	4.0	WSW	3.1	NW	2.2	N	2.2	N
16:00-17:00	2.7	NE	1.8	ESE	3.1	W	3.1	N	3.6	NW
17:00-18:00	0.9	ENE	2.2	NNE	3.1	WNW	2.2	N	3.1	NNW
18:00-19:00	0.4	ENE	1.3	NNE	1.3	NW	1.8	N	4.0	NNW
19:00-20:00	0.9	ESE	<0.4	Calm	0.4	N	0.9	NE	4.0	NNW
20:00-21:00	0.9	NE	<0.4	Calm	0.9	N	1.8	NE	2.7	N
21:00-22:00	0.4	ENE	<0.4	Calm	1.3	NE	1.8	NNE	0.9	N
22:00-23:00	0.9	NE	<0.4	Calm	1.8	N	1.3	NNE	1.3	NNE
23:00-00:00	0.9	N	<0.4	Calm	1.3	NNE	0.9	NNE	1.3	NNE
00:00-01:00	0.9	NNE	0.4	ENE	1.3	NE	<0.4	Calm	1.3	NE
01:00-02:00	1.3	NE	0.9	NE	0.9	NNE	<0.4	Calm	1.3	NNE
02:00-03:00	1.3	ENE	0.9	NE	0.9	N	<0.4	Calm	<0.4	Calm
03:00-04:00	1.3	ENE	1.3	NE	0.9	NNE	0.4	N	<0.4	Calm
04:00-05:00	0.9	NE	0.9	NE	1.3	N	<0.4	Calm	<0.4	Calm
05:00-06:00	0.9	NE	0.9	NE	0.9	ENE	0.4	NNW	1.8	N
06:00-07:00	1.3	NE	0.9	NE	0.9	N	<0.4	Calm	1.8	N
07:00-08:00	1.3	NNE	1.3	NE	0.9	NNE	<0.4	Calm	1.3	N
08:00-09:00	1.3	ENE	0.9	NE	1.3	N	0.9	N	0.4	N
09:00-10:00	0.9	NNE	1.3	N	3.1	N	2.7	N	1.8	N

Remark : WS = Wind Speed (m/s)
WD = Wind Direction
Height of wind vane and anemometer above ground 10 meters.

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ANALYSIS REPORT

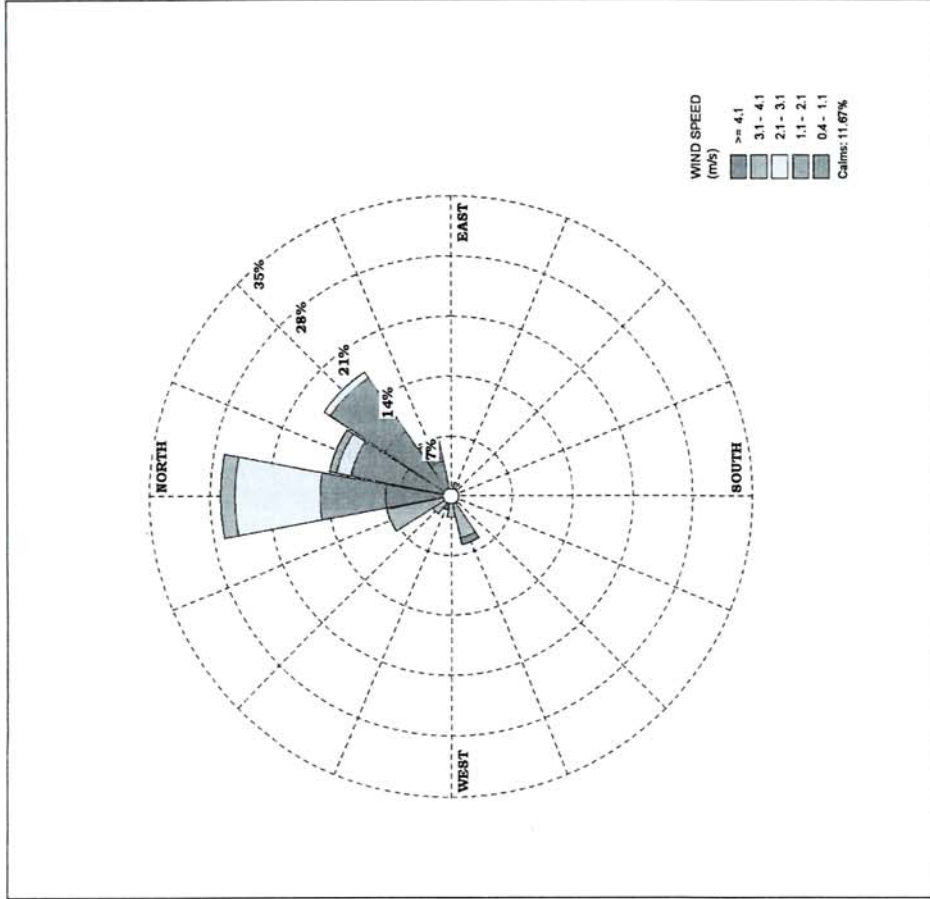
Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาสิ่งแวดล้อมระดับพื้นที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดนนทบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานี 1 : บริเวณพื้นที่ก่อสร้างโครงการ
GPS. Coordinate : UTM (WGS84) 47P 0707858 E, 1442972 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Chammanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-001 - 005
Report No. : 2022-BAK036
Report Date : December 7, 2022

Wind Direction	Percentage frequency of wind in each speed and direction							Total
	0.4-1.1	1.1-2.1	2.1-3.1	3.1-4.1	≥4.1			
N	7.50000	7.50000	10.00000	1.66667	0.00000			26.66667
NNE	5.83333	5.83333	1.66667	0.83333	0.00000			14.16666
NE	9.16667	7.50000	0.83333	0.00000	0.00000			17.50000
ENE	4.16667	2.50000	0.00000	0.00000	0.00000			6.66667
E	0.00000	0.00000	0.00000	0.00000	0.00000			0.00000
ESE	0.83333	0.83333	0.00000	0.00000	0.00000			1.66666
SE	0.00000	0.00000	0.00000	0.00000	0.00000			0.00000
SSE	0.00000	0.00000	0.00000	0.00000	0.00000			0.00000
S	0.00000	0.00000	0.00000	0.00000	0.00000			0.00000
SSW	0.00000	0.83333	0.00000	0.00000	0.00000			0.83333
SW	0.00000	0.00000	0.00000	0.83333	0.00000			0.83333
WSW	0.00000	0.00000	0.83333	4.16667	0.83333			5.83333
W	0.00000	0.00000	0.00000	2.50000	0.00000			2.50000
WNW	0.00000	0.00000	0.00000	0.83333	0.83333			1.66666
NW	0.00000	0.83333	0.00000	1.66667	0.00000			2.50000
NNW	0.83333	0.00000	0.00000	6.66667	0.00000			7.50000
Calm						11.66670		

ANALYSIS REPORT

Customer Name : กรมท่าเรือกรุงเทพ
Project Name : โครงการพัฒนาระบบขนส่งสาธารณะท่าเรือ 3 (ส่วนที่ 1 & 4)
Measured Point : สถานี 1 : บริเวณท่าเรือกรุงเทพ
Measured Date : November 17-22, 2022
Reported Number : 2022-RAAK036



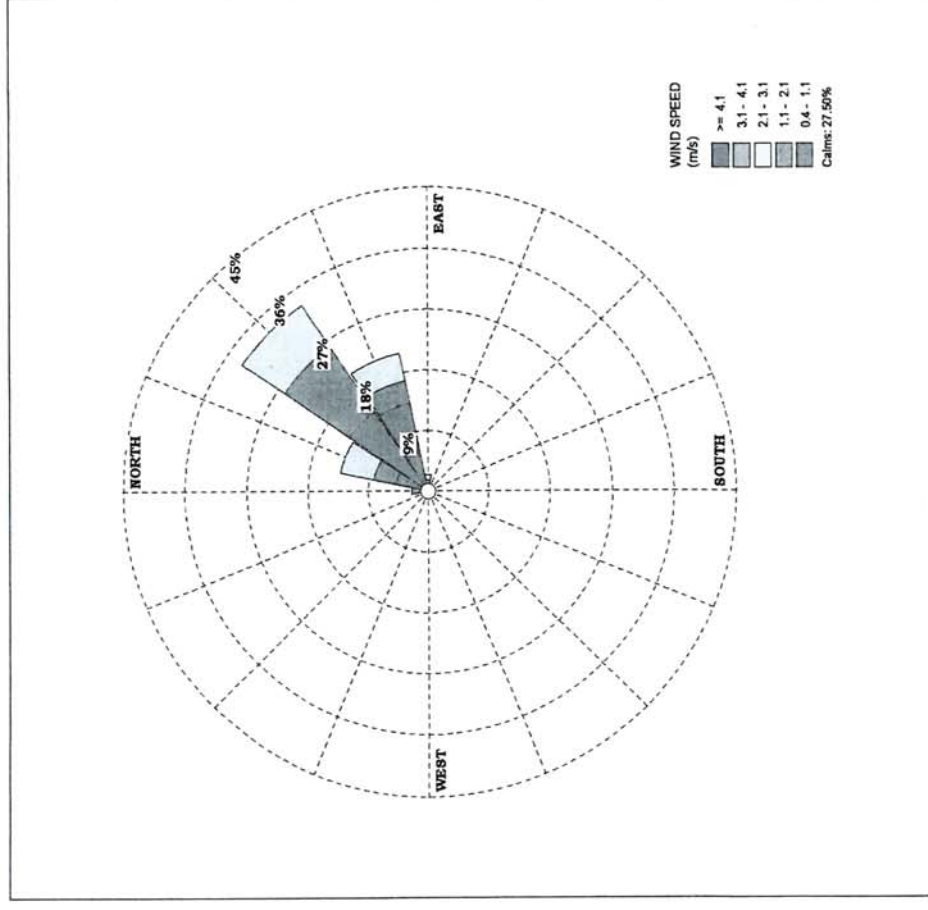
ANALYSIS REPORT

Customer Name : การทำฝนหลวงเพื่อไทย
Address : เลขที่ 444 ถนนพหลโยธิน แขวงจตุจักร เขตจตุจักร กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาทำฝนหลวงเพื่อประเทศไทย 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดอุบลราชธานี
Measured Source : Ambient Air Quality
Measured Point : สถานี 2 : บริเวณโรงเรียนพุทธมณฑล ตำบลนาบว อำเภอเมือง จังหวัดอุบลราชธานี
GPS, Coordinate : UTM (WGS84) 47P 0708730 E, 1444258 N
Measured Date : November 17-22, 2022
Measured By : Mr. Apiwat Channanweh
Analyzed By : Environment Research & Technology Co., Ltd.
Quotation No. : 2021-00430
Analysis No. : 2022-AE458-006 - 010
Report No. : 2022-RAAK037
Report Date : December 7, 2022

Wind Direction	Percentage frequency of wind in each speed and direction					
	0.4-1.1	1.1-2.1	2.1-3.1	3.1-4.1	≥4.1	Total
N	0.83333	1.66667	0.00000	0.00000	0.00000	2.50000
NNE	5.00000	3.33333	5.00000	0.00000	0.00000	13.33333
NE	14.16670	11.66670	7.50000	0.00000	0.00000	33.33340
ENE	13.33330	3.33333	4.16667	0.00000	0.00000	20.83330
E	0.83333	0.83333	0.83333	0.00000	0.00000	2.49999
ESE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
S	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
WSW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
W	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
WNW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NNW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Calm	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
				27.50000		

ANALYSIS REPORT

Customer Name : การทำฝนหลวงเพื่อไทย
Project Name : โครงการพัฒนาทำฝนหลวงเพื่อประเทศไทย 3 (ส่วนที่ 1 ถึง 4)
Measured Point : สถานี 2 : บริเวณโรงเรียนพุทธมณฑล ตำบลนาบว อำเภอเมือง จังหวัดอุบลราชธานี
Measured Date : November 17-22, 2022
Reported Number : 2022-RAAK037



ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาวิจัยสิ่งแวดล้อมระยะที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดภูเก็ต
Measured Source : Ambient Air Quality
Measured Point : สถานี 3 : บริเวณท่าอากาศยานนานาชาติสนามบินภูเก็ต อำเภอเมืองภูเก็ต จังหวัดภูเก็ต
GPS. Coordinate : UTM (WG84) 47P 0708144 E, 1442225 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Charnmanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

Quotation No. : 2021-00430
Analysis No. : 2022-AE458-011 - 015
Report No. : 2022-BAAK038
Report Date : December 7, 2022

Date/Time	Nov 17-18, 22		Nov 18-19, 22		Nov 19-20, 22		Nov 20-21, 22		Nov 21-22, 22	
	WS	WD	WS	WD	WS	WD	WS	WD	WS	WD
09:00-10:00	0.4	N	0.4	SW	<0.4	Calm	0.4	NNE	0.9	NNE
10:00-11:00	0.4	N	0.4	SW	0.9	NNE	0.9	NNE	0.4	NNE
11:00-12:00	0.4	NW	0.9	NW	0.9	NNE	0.4	NE	0.9	NNE
12:00-13:00	0.9	NW	2.2	NW	1.8	NNE	0.4	N	1.3	NNE
13:00-14:00	2.2	NNW	2.7	NW	2.7	N	<0.4	Calm	0.4	NNE
14:00-15:00	1.8	WNW	3.1	NW	2.2	N	<0.4	Calm	0.4	NE
15:00-16:00	0.9	WSW	1.8	WSW	1.3	N	0.4	NNE	0.4	NNE
16:00-17:00	<0.4	Calm	<0.4	Calm	3.1	NNW	0.4	NE	1.8	N
17:00-18:00	<0.4	Calm	<0.4	Calm	1.8	N	<0.4	Calm	1.3	NNE
18:00-19:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	0.9	NNE
19:00-20:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	0.9	NNE
20:00-21:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	0.4	NNE
21:00-22:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
22:00-23:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
23:00-00:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
00:00-01:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
01:00-02:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
02:00-03:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
03:00-04:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
04:00-05:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
05:00-06:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
06:00-07:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
07:00-08:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm
08:00-09:00	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm	<0.4	Calm

Remark : WS = Wind Speed (m/s)
WD = Wind Direction
Height of wind vane and anemometer above ground 10 meters.



ANALYSIS REPORT

Customer Name : การทำวิจัยสิ่งแวดล้อม
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองเตย เขตคลองเตย กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาวิจัยสิ่งแวดล้อมระยะที่ 3 (ส่วนที่ 1 ถึง 4)
Project Location : จังหวัดภูเก็ต
Measured Source : Ambient Air Quality
Measured Point : สถานี 3 : บริเวณท่าอากาศยานนานาชาติสนามบินภูเก็ต อำเภอเมืองภูเก็ต จังหวัดภูเก็ต
GPS. Coordinate : UTM (WG84) 47P 0708144 E, 1442225 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Charnmanweeh
Analyzed By : Environment Research & Technology Co., Ltd.

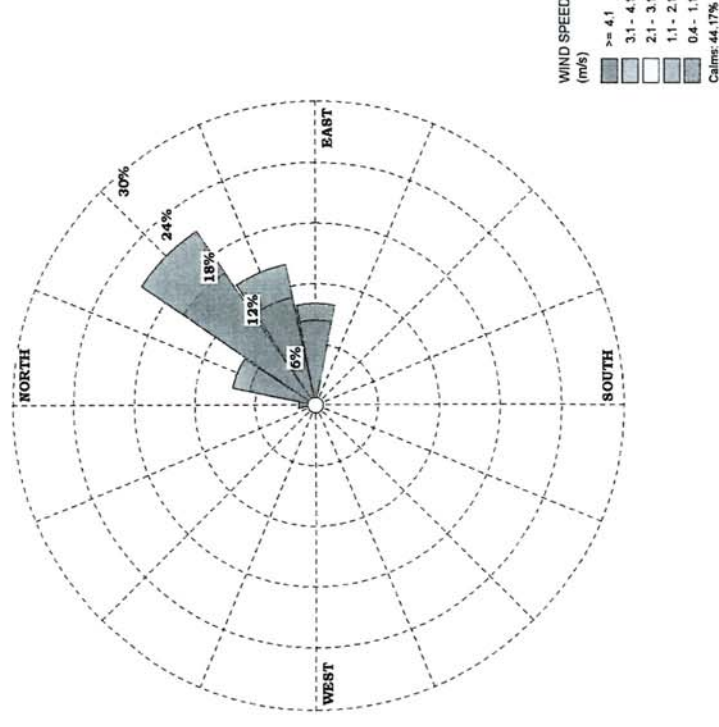
Quotation No. : 2021-00430
Analysis No. : 2022-AE458-011 - 015
Report No. : 2022-BAAK038
Report Date : December 7, 2022

Wind Direction	Percentage frequency of wind in each speed and direction					Total
	0.4-1.1	1.1-2.1	2.1-3.1	3.1-4.1	≥4.1	
N	2.50000	2.50000	1.66667	0.00000	0.00000	6.66667
NNE	10.83330	2.50000	0.00000	0.00000	0.00000	13.33330
NE	2.50000	0.00000	0.00000	0.00000	0.00000	2.50000
ENE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
E	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ESE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
S	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SW	1.66667	0.00000	0.00000	0.00000	0.00000	1.66667
WSW	0.83333	0.00000	0.00000	0.00000	0.00000	0.83333
W	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
WNW	0.00000	0.83333	0.00000	0.00000	0.00000	0.83333
NW	2.50000	0.83333	1.66667	0.83333	0.00000	5.83333
NNW	0.00000	0.00000	0.83333	0.83333	0.00000	1.66666
Calm	66.66670					

ANALYSIS REPORT

Customer Name : การทำฝนหลวงเพื่อช่วยเหลือ
Address : เลขที่ 444 ถนนพหลโยธิน แขวงคลองจั่น เขตจตุจักร กรุงเทพมหานคร 10110
Project Name : โครงการพัฒนาทำฝนหลวงเพื่อช่วยเหลือ (ส่วนที่ 1 ของ 4)
Project Location : จังหวัดนนทบุรี
Measured Source : Ambient Air Quality
Measured Point : สถานี 4 : บริเวณโรงเรียนวัดท่าอิฐ ตำบลบางบาล อำเภอบางบาล จังหวัดนนทบุรี
GPS, Coordinate : UTM (WGS84) 47P 0709192 E, 1440398 N
Measured Date : November 17-22, 2022
Measured By : Mr.Apiwat Channaweeh
Analyzed By : Environment Research & Technology Co., Ltd.
Quotation No. : 2021-00430
Analysis No. : 2022-AE458-016 - 020
Report No. : 2022-RAAK039
Report Date : December 7, 2022

Wind Direction	0.4-1.1	1.1-2.1	2.1-3.1	3.1-4.1	≥4.1	Total
N	1.66667	0.00000	0.00000	0.00000	0.00000	1.66667
NNE	6.66667	1.66667	0.00000	0.00000	0.00000	8.33334
NE	15.83330	5.00000	0.00000	0.00000	0.00000	20.83330
ENE	10.83330	3.33333	0.00000	0.00000	0.00000	14.16663
E	8.33333	1.66667	0.00000	0.00000	0.00000	10.00000
ESE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
S	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SSW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
SW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
WSW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
W	0.83333	0.00000	0.00000	0.00000	0.00000	0.83333
WNW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
NNW	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Calm	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
						44.16670



ANALYSIS REPORT

Customer Name : การทำฝนหลวงเพื่อช่วยเหลือ
Project Name : โครงการพัฒนาทำฝนหลวงเพื่อช่วยเหลือ (ส่วนที่ 1 ของ 4)
Measured Point : สถานี 4 : บริเวณโรงเรียนวัดท่าอิฐ ตำบลบางบาล อำเภอบางบาล จังหวัดนนทบุรี
Measured Date : November 17-22, 2022
Reported Number : 2022-RAAK039